X

NOTE

ON AN

INSPECTION OF THE FORESTS

IN

OUDH,

IN

MARCH AND APRIL 1886.

BY

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B. R.

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Introduction.

A large demand for timber and sleepers arose in consequence of the construction of the Rohilkhand and Kumaun, of the Bengal North-Western, and of several Provincial State Railways in Oudh. Some of the State Reserves, and more especially those of the Kheri Division, being favourably situated, were largely worked in order to meet the requirements, and heavy fellings took place in the Kheri Forests, largely in excess of the annual outturn provided in the forecast compiled by Dr. Brandis in 1881. The success of fire-protection seemed at the same time by no means sufficiently ensured, and in April and May 1883 extensive conflagrations spread over nearly half the area the protection of which had been attempted.

This attracted the attention of the Government of India, and it was considered advisable to place it beyond doubt whether the Kheri Forest was worked within its potential capability, or whether this had been, and was being, exceeded.

With this in view, it was ordered that the preliminary enquiries and enumerations necessary for the framing of a working-plan for the Kheri sál forests should be begun without delay; and I was directed to proceed to Oudh during the end of the cold season to inspect the forests, and to advise on the work in hand. I arrived at Motipur in the Bahraich Division on the 20th March, and left Pilibhit on the 22nd April. In the meantime I examined, in as great detail as the time at my disposal would admit, the sál forests of Motipur, Kheri, Bhira, Puranpur, and Pilibhit, as well as considerable areas of the low-lying forests and grazing grounds.

I.—Physical Distribution of the Forests.

2. The Himalayas between Naini Tal and the Rapti generally rise abruptly from the plains into a mountain chain of considerable altitude, and the distinct features of intervening Siwaliks and Dúns, which characterize the approach to the main mountain ranges further towards the west, are more or less obliterated. The Tarai lies immediately below the high hills.

East of the Rapti the outer hill range, as far as it forms the boundary of British territory, does not rise above 2,000 feet, and the Siwalik character of the hills reappears, to be lost again further towards the east, where the plains of Gorakhpur are surrounded by an amphitheatre of high hills.

Wherever the Tarai approaches the high ranges directly and without intervening Siwaliks, a very extensive and more or less continuous belt of magnificent deciduous forests underlies the hills. These forests are generally known as those of the Nipal Tarai; the bulk of them are situated beyond the British boundary, and the Motipur and Kheri forests are only portions of the outer and deeply serrated fringe of the compact forest area in Nipal, in the same way as the Pilibhit, Puranpur, and Bhira forests are the last straggling off-shoots of the more extensive forests of the Kumaun Tarai. The Bhinga forests are situated on Tarai land formed at the foot of the low Rapti Siwaliks, and the Gorakhpur forests are the southern extremities of the Tarai forests below the Deoniagarh. The greater part of these forests is again situated in Nipal. The Tulsipur forests occupy the lower and more gentle slope of the Siwaliks—the debris, so to say, at the foot of the original hills. The subsoil of this debris consists of disjointed rock, loose shingle, and gravel, into which the water draining down the steeper hill sides sinks rapidly, to reappear only when the general level of the country has been reached. This naturally leaves the surface of the intermediate slope exceedingly dry, and fit only to bear a very open forest, mainly composed of *Anogeissus latifolia*.

3. The Tarai, on the outskirts of which are situated, as already noted, the more valuable State forests in the Oudh Circle, is formed by the alluvium of the Sarda, the Kauriala, the Rapti, and by the deposits of numerous smaller streams debouching from the Himalaya range. For our purpose it may be divided into two main classes. The one is the low-lying unsettled alluvium,

which, still in the active process of formation, is constantly subjected to periodical or accidental changes by the diversions of the rivers which intersect it, and which assist in its formation. The second class is the high-lying stable ground forming, as a rule, the main watersheds, which have ceased to be subject to changes, but which owe their existence to an action similar to that now observable on the low grounds, as is clearly proved by the numerous lakes, depressions, and traces of old river-beds.

In the still forming alluvium periodical and accidental overflows are frequent. The former, the main agent for the formation of the alluvium, are due to the gradual rising of the river beds and their immediate surroundings above the level of the country, till the balance is lost, a spill occurs, and the course of the river is changed for the time being, again to rise above the general level, and again and again to find a lower bed, thus forming an alluvium by a succession of silt waves, both in the direction of the river and vertical to its axis. This action takes place till the country is raised above the influence of natural floods. In some instances the floods and changes in the river courses are due to accidental obstructions, which may cause changes even in an alluvium beyond the influence of ordinary floods; and the Mala swamp, which is doubtless a comparatively modern channel of the Sarda cut through an alluvium raised above the ordinary influences, evidently owes its existence to some such accident of considerable magnitude. When the obstruction was removed, the temporary drainage line was no longer required, and became the Mala swamp.

Large rivers, like the Sarda and Kauriala, debouching directly from the high hills into the open plains, require extensive play-grounds; and though the sphere of their action has been, as is evident from a study of the country, considerably curtailed in the course of ages, a glance at an accurate map reveals the enormous extent of country which has recently been, or is still, within the direct influence of their action.

The sub-soil of the stable, as well as the still forming alluvium, is a coarse white sand rich in undecomposed mica. On the high stable ground this is covered with a layer of loamy sand, varying in depth from a few feet to 20 feet and more. It is unquestionable that this layer of good soil is mainly due to decomposition under the influence of vegetation; for the sand, which underlies these beds of loamy soil, is the same as that carried down by the rivers at present. With the rise of the alluvium the floods become more gentle, and a more fertile silt is frequently deposited together with the coarser sand. The degree of decomposition, and consequent mellowness and fertility of the soil, varies as much as its depth.

The sterile sand on the low-lying ground lies frequently exposed, or is only thinly covered by fertile soil, which, moreover, is usually coarser in its composition, and liable, by the next overflow, to be recovered with fresh river-sand.

4. The waters flooding the low ground carry large quantities of seeds, as well as silt, and these, as a rule, germinate freely.

Frequently the young growth is destroyed again by a subsequent submersion or other accident, and, under these circumstances, the areas are only covered with more or less coarse grasses.

As soon, however, as the land has gained a level which protects it against a regular annual overflow, or, in case the river has altered its course, the seedlings gain in strength, and, if left in undisturbed possession of the ground, a forest forms on the low-lying alluvium, of which *Dalbergia Sissoo* and *Acacia Catechu* are the most characteristic representatives. The stable and high-lying grounds are occupied by forests characterized by Sál *(Shorea robusta)* and Asseina *(Terminalia tomentosa)*. The sál tree cannot grow where it is still liable to be flooded, or even where its surface roots suffer from want of drainage; but when this has ceased to be the case, sál is a formidable rival to any other forest tree, owing to its great power of resistance to shade, the facility with which it coppices, its ability to grow closely, and its extraordinary reproductive powers. I have no doubt that the extermination of sissu and khair on the higher grounds, which they must once have occupied, is mainly due to this, though I have not been able to verify this theory by practical observation.

The division between the sál forest and miscellaneous forest is not always as abrupt as that between the khair forest and the sál forest; but, broadly speaking, the forests in the Oudh Circle may be divided into miscellaneous forests, khair forests, and sál forests.

5. The Government Forests contain, according to the records at my disposal:—

	Square miles.
Sál forests	586
Miscellaneous forests	89
Low grounds (Khair and Sissu forests)	245
Phantas	212
Total ...	1,132

This statement, however, gives a by far too favourable picture for the area here exhibited, as the khair and sissu forests include a considerable extent, probably upwards of 50 per cent., of swamps and grounds which are still exposed to annual floods, and which consequently can produce nothing but grass; and even those portions of the low-lying land which are capable of growing a khair and sissu forest, and where numerous stumps and remnants of dead trees prove that a forest once existed, are, as a rule, mere grass plains, interspersed with more or less compact plots or belts of forest growth, and here and there studded with single trees, which, for some reason or other, escape the general annual conflagration.

The sál forests in the trans-Sarda localities, especially those forming the Kasumba and Dudua blocks, also contain large *phantas*, or low-lying open patches of ground, on which the water collects during the rains, and which consequently produce nothing but reeds and grass; and those in the cis-Sarda tracts include large areas, amounting perhaps to a moiety of the forests, which at present can produce nothing better than an annually dying crop of sál scrub.

II.—Constitution of Forest Reserves.

6. The Government Forests in the Oudh Circle were constituted Forest Reserves under section 34 of the Forest Act by Notifications Nos. 193 to 198, dated 28th February 1879. Those situated in the Pilibhit and Gorakhpur Collectorates lie in the North-Western Provinces; the rest in Oudh.

The areas composing the present Reserves were at the time of British occupation almost without exception unoccupied waste, situated outside the then existing village boundaries. They were beyond dispute the property of the State, and Government has in many cases not hesitated to transfer the complete proprietary rights over such areas to grantees or cultivators. In the North-Western Provinces, but not in Oudh, conditions were attached to such transfers and grants, by which the right in spontaneous forest growth was reserved to Government, and under which the utilization of such forest produce to which people had been accustomed was permitted; but these conditions were naturally extinguished when the land was brought under the plough, or when it was sold out and out, which was done on several occasions. Every such sale or grant was consequently a negation of any rights existing over the areas in question.

Subsequently, however, the status of the forest property became more or less complicated, or at least was considered to have become so; and it will probably not be out of place to review shortly the history of the constitution of each block of our Forest Reserves in the Oudh Circle separately.

7. The Pilibhit Reserve is situated in the North-Western Provinces, in pargana Pilibhit, in the district of the same name.

With the exception of the lands of three deserted villages which were resumed, the Government Forest was formed by taking up waste lands belonging to the State. The inhabitants of the surrounding country had undoubtedly made use of the forest to the extent they required, both as regards grazing and other forest produce, even before the area was demarcated as a Government Forest. The people, as has been the custom almost over the whole of India, were permitted to help themselves to the spontaneous produce of waste lands belonging to the State as long as such land was not required for any other special purpose. Whether, and to what extent, the Pilibhit Forests were actually used in former years cannot be ascertained; but it may be presumed that the requirements were much less in degree than they are now, and the areas from which they could be supplied more extensive. Forest produce extracted from the areas at present forming the Pilibhit Reserve was, I understand, paid for, the Collector receiving the dues departmentally; but, under any circumstances, there is no question that payments were enforced since it was first demarcated as Government Forest property.

The Government Forest was declared to be a Reserve by Notification No. 193 of the 28th February 1879; and as the Local Government was not satisfied that the rights of the people within this Reserve had been sufficiently enquired into, settled, and recorded, it was decided that a Settlement should take place under the Forest Act, and the Collector of Pilibhit was appointed Forest Settlement Officer. Under the Settlement made and finally sanctioned, 44 villages have been entered as right-holders, in as far as they shall have a right to have their wants supplied at current rates before the demands of outsiders can be considered.

These rights have been admitted as arising by prescription. This decision is legally wrong, for a prescriptive right over any forest cannot be acquired by continuous purchase of its produce from the owner at market rates; the elements of adverse enjoyment, and of enjoyment as of right on which prescription rests, are wholly wanting. The Forest Settlement Officer has, therefore, burdened this Reserved Forest with legal obligations which were not in existence previous to the Settlement.

The records of the Settlement are more involved than is contemplated by the Forest Act, in as far as they are complicated by rules which not only repeat, but modify, parts of the original Settlement. It is apparently the intention that only 9,280 acres, forming the west and south-west portions of the Pilibhit Reserve, shall be subject to the recorded rights; but, after a perusal of the decision of the Settlement Officer and the rules, I do not feel quite certain whether this is expressed with sufficient distinctness. The area of the Pilibhit Reserve contains 47 square miles, classed as sál forests.

8. The Puranpur Forest Reserve is also situated in the Pilibhit District, pargana Puranpur. The areas at present comprised within this Reserve were at one time, when it was considered advisable to extend cultivation at any cost, divided and marked out into grants. Some of these grants were never given out, and others were resumed from grantees, who either failed to pay the revenue due, or to bring the area stipulated by the grant under cultivation.

The very fact that these forests were given out as grants for cultivation should be sufficient proof that they were originally unburdened by rights; and, if more proof was needed, I would point out that some adjoining tracts, which originally formed part of the area divided into grants, have either been cleared of all natural forest produce, or have been sold out and out, and now form private forests, in which no rights exist. The rights at present admitted are, therefore, clearly rights of our own creation.

The Puranpur Forest was created a Forest Reserve, under section 34 of the Forest Act, at the same time as the Pilibhit Reserve; and here, too, it was considered that a Settlement of existing rights was required.

In this Settlement not less than 270 villages were recorded as right-holders, who are entitled, as regards their own requirements, to free grazing and to the following forest produce free of charge :—

Wood for ridge poles.
" " roofing and thatching.
" " ploughs.
" " sugar-mills.
" " dhonkalis
" " fences.
" " fire.
Grass " thatching.
" and fibre for ropes.

The rights are said to have been obtained by prescription. I doubt whether this was legally possible as long as the Waste Land Rules were in force, as they would have permitted the entire alienation of any portion of the area included within the Puranpur Reserve. The Forest Settlement Officer has, moreover, decided, in his judicial capacity, that *prescriptive* rights exist for *prospective* requirements. This decision is of course legally quite untenable, for it is impossible to conceive the existence of a prescriptive right in excess of previous enjoyment. The whole question seems to depend on the interpretation of the order by the Commissioner of Rohilkhand, dated the 10th January 1850, granting free grazing and forest produce to the people of the pargana Puranpur. If this conferred a right, then such right existed at the time of the recent Forest Settlement; but I believe that the sale of grant No. 1 to Mr. Carew took place subsequent to the Commissioner's order, which would throw considerable doubt on this view. However, the rights recorded are now rights by grant. The extent of the rights is not recorded as prescribed by the Forest Act.

The list of areas of private forests in pargana Puranpur. (Appendix A) shows that many of the villages now declared to be right-holders have extensive forest lands of their own.

The rules, which form an integral portion of the Settlement, permit the burning of two-thirds of the Reserve, happily only until further notice.

The area of the Reserve amounts at present to—

	Square miles.
Sál	48
Sál scrub	50
Grass	7
Total ...	105

9. The areas at present included within the Gorakhpur Reserve, also situated in the North-Western Provinces, are sál forests. They were Government waste lands, which, without any preliminaries, were formed into State forests. The grass lands in the same district were divided into grants, and placed under the control of the Civil authorities, to be given out for cultivation. This measure, however, met with very little success, and some two years ago these areas, aggregating 26,827 acres, were made over to the Forest Department. These lands are presumably all free of rights.

The present area of the Reserve amounts to :—

Sál.	Sissu and Khair.	Grass Lands.	Total.
Square miles.	Square miles.	Square miles.	Square miles.
102	.....	55	157

A considerable number of the grants, into which the Gorakhpur Forests were divided, were taken up, but were not cultivated to the proportion demanded by the original grant. They were not, however, resumed as in other parts of the Province, and Government even ruled (*vide* G. O. No. 675, dated 27th May

1885) "that there is no objection to the grantees keeping as much of their land under forest as they please, except where clearance is considered necessary for sanitary purposes."

The Commissioner of the Benares Division thinks that Government is in no way debarred from resuming these lands under the conditions of the original grants, provided due notice is given to the grantees that the Government desire to alter their policy, and wish that the proportion originally specified shall be cultivated. If this be done, the Commissioner has no doubt that, owing to the large increase in the value of the property, the area stipulated in the grant would be brought under cultivation. Whether or not this be desirable is a question which ought to be decided after a careful local enquiry.

10. The areas comprised within the Bhira Forest Reserve, which is situated in the Bhira sub-division of the Kheri District, were originally divided into grants, which, with one or two exceptions, have been in the possession of grantees, and were resumed either because the grantees failed to clear the proportion of land which had been stipulated, or because they failed to pay the revenue for which they were liable. The areas which fell in again, and those which were never sold or granted, were, between 1870 and 1875, formed into a Government forest, which was declared to be a Reserved Forest, under section 34 of the Forest Act, by Notification No. 194, dated 28th February 1879.

11. The forests at present contained within the Kheri trans-Sarda Reserved Forests have always been in the possession of Government. The sál forests were demarcated as a State Forest and surveyed in 1861-62.

The low-lying forest and grass lands, including the Sumerpur Forest, were divided into grants, and were advertised for sale or grant, but none were, as far as can be ascertained, ever in the hands of grantees; and when the attempts to dispose of them had failed, they were added to the area of State Forests in 1867-68, and the whole was formed into Reserved Forests, under section 34 of the Forest Act, by Notification No. 194, dated 28th February 1879.

These Reserves contain, in square miles:—

Sál Forest.	Miscellaneous Forest.	Sissu and Khair Forest.	Grass Lands.	Total.
150	13	20	80	263

12. The Bahraich Forest Reserves were, with one exception, formed direct by the taking up of Government waste lands.

A large portion of the Charda Forest was held in grant by the Maharaja of Balrampur for six years, but was resumed as the proportion, which was stipulated in the lease, had not been cultivated.

The Forest Reserves in Gonda were partly formed by directly taking up Government land, and have partly passed through the hands of grantees. All the main forests north of Tulsipur never changed proprietorship, whereas the whole of the Nawabganj Forests were in the possession of lease-holders, and have been resumed.

The Bahraich and Gonda Government Forests were declared to be Reserved Forests, under section 34 of the Forest Act, by Notifications Nos. 196 and 197, dated 28th February 1879.

The Reserves in Bahraich contain:—

Sál Forest.	Miscellaneous Forest.	Sissu and Khair Forest.	Total.
Sq. m.	Sq. m.	Sq. m.	Sq. m.
197	27	101	325

Those in Gonda:—

Sál Forest.	Miscellaneous Forest.	Sissu and Khair Forest.	Grass Lands.	Total.
Sq. m.	Sq. m.	Sq. m.	Sq. m.	Sq. m.
43	61	4	40¼6	154

13. To repeat shortly, the Forest Reserves in the Oudh Circle were all declared to be reserved under section 34 of the Indian Forest Act.

The Pilibhit and Puranpur Forest Reserves have undergone a subsequent Forest Settlement under Chapter II of the Indian Forest Act, and are now burdened with acknowledged rights and rights by grant. No declaration has as yet been made whether the existence of rights has been enquired into as regards the Gorakhpur Forest Reserves, or whether Government considers that it is sufficiently proved that no rights whatsoever exist. The Gorakhpur Forest Reserves are, like those of Pilibhit and Puranpur, situated in the North-Western Provinces, and are constituted in a similar manner. If, therefore, an enquiry under the Act was necessary as regards these latter, the desirability of a similar enquiry with regard to the Gorakhpur Forests seems indicated, and the proprietary status of the Reserve remains unsettled till such enquiry has taken place, or till a declaration has been issued that no rights exist over the forest areas in question.

As regards the Reserved Forests in Oudh, situated in the Kheri, Bahraich, and Gonda Districts, it is understood that the constitution of the Reserves and the conditions of the Waste Land Rules, to which the lands forming the Reserves were once subject, prevent the possibility of the existence of any rights. This fact has been acknowledged by the Local Government on several occasions; but as, in the very complicated correspondence touching this question, "privileges," which were from time to time admitted by executive orders during the pleasure of Government, have by some writers been treated as synonymous with rights, a formal declaration of the fact that no rights whatsoever exist would settle the question for ever, as the accrual of any new rights, except under grant or contract, would be barred under section 22 of the Indian Forest Act.

III.—Privileges.

14. As already pointed out, the Local Government, though they laid down that no rights existed, granted from time time concessions in favour of villages situated within 3 miles from the forest boundaries, with regard to the extraction of inferior timber for their own domestic and agricultural requirements, dead wood for burning, and the grazing of their cattle at reduced rates. These concessions were, as may be gathered from the correspondence regarding them, granted with the view of encouraging cultivation in the vicinity of the Forest Reserves; and in order that they might be secured to the inhabitants, it was for a long time considered advisable that they should be recorded as privileges. This has never been done, and luckily so, for the Indian Forest Act does not recognize any privileges; and, whatever precautions might have been taken, privileges thus recorded would, I feel certain, have sooner or later grown into rights by grant. Experience has in the meantime, moreover, shown that the concessions did not have the desired results, which depend naturally more on the quality of the land near the forest and other conditions than on extensive forest privileges. The exercise of such privileges is demoralizing, and rather distracts the villagers' attention from agriculture than otherwise; and, on the other hand, the record of privileges places unnecessary difficulties in the way of any change of management, and in the way of the more extensive working of the forests, which will no doubt be required as the natural consequence of railway extension and the general development of the country.

It would be an injustice to the country at large to continue concessions which at one time, though they were of but small advantage to the concessionist,

did not materially affect the well-being of society at large, but which under altered circumstances prevent the State forests, the value of which has greatly increased, from being managed for the best interests of the majority.

The Reserves are after all a State property, held in trust by Government, which the trustee has no right to burden with obligations for the benefit of a certain class of people, if the law has decided that no such obligations exist as by right, though such a step might be justified by necessity; but no such necessity exists, and I only quote a widely-spread opinion, which is borne out by my own observations with regard to the forest areas in the Bahraich and Kheri Districts, that the liberal concessions granted have not only failed to secure the effects expected, but that they benefit to a great extent people for whose enjoyment they were never intended. The villages near the forests are, as a rule, not settled communities, but mere congeries of graziers, who frequently make their livelihood out of the privileges, conferred in order to encourage cultivation, by grazing cattle belonging to people as far down as Lucknow.

Another consquence of these vaguely limited privileges is over-breeding. The majority of the cattle are not kept for agricultural purposes, and in many instances not even for dairy purposes, but merely because they have happened to be born. I have seen many wretched heifers with tiny half-starved calves, for which they had not got milk enough, and the Deputy Commissioner of Bahraich told me that last year he found the greatest difficulty in collecting some 3 or 4 seers of milk from upwards of 30 head of milch kine.

A census would probably show large numbers of cattle, but it would be utterly misleading to gauge the wealth of the country by the mere numerical strength of the herds, a great portion of which is not only perfectly useless, but is actually a source of poverty. It is well known that the people in the vicinity of the forest, who own these large herds of cattle, are not only worse cultivators than their neighbours, but they are poorer as well.

It has been said that the forests are large, and that it is therefore necessary to grant privileges such as proposed. This is an error, for the forests in the Central Provinces are many times larger; but still no privileges exist, and no difficulty is experienced on that account, nor is grazing unnecessarily curtailed in any way.

It has frequently been considered necessary to guard the position of people who are backward in their manner and way of husbandry against the advancing demands of increasing civilization; and the wish which was till lately entertained to record as privileges the concessions granted to villagers in the vicinity of the Oudh forests, falls within these views. I understand that this idea has been entirely abandoned, as these concessions, which it seemed at one time advisable, if not necessary, to grant, have since proved themselves to be unnecessary, and even opposed to the most successful management of the State forest property. I am convinced that there need be no apprehension that the equitable requirements of the villages within the vicinity of the forests will not be sufficiently met under purely executive arrangements and orders, as regards the supply of wood and other forest produce, as well as grazing. If it is still considered necessary that the agricultural cattle of the villagers within a 3-mile belt from the Forest Reserve boundaries should graze their cattle at lower rates, this can be effected by executive orders bearing force for limited periods, and it would probably be advisable to restrict such concessions to *bonâ fide* agricultural cattle in proportion to the area under cultivation.

The Commissioner of the Central Division in the Bombay Presidency says with regard to this subject :—" One pair of bullocks can be used to work about 24 acres of land. I therefore recommend that the rule should be that one bullock should be allowed to graze free for every ten acres of land held by a ryot."

That a thorough revision of the present grazing arrangements is necessary is generally acknowledged, but the arguments in favour of such revision may be strengthened by the record of a personal observation of mine. The villagers of Kiratpur have till now been permitted to graze their buffaloes in the north-east

part of the Newálkhar block of the Kheri Forest, and I saw compartments 4 and 5 of this valuable sál forest deliberately fired to produce an early grass crop for some 15 to 20 buffaloes. This is of course extravagant to a degree, but only represents one instance of what takes place on all sides of our fire-protected blocks as a consequence of the grazing privileges permitted.

IV.—Motipur Forest Reserves.

15. The Motipur Forests are situated on the alluvium between the Chota Sarjú (or Babai) and Kauriala. The total area of these Reserves is estimated at 127 square miles, and of these about 60 square miles occupy high-lying stable lands, which are consequently covered with sál forests, with the exception of a fringe near the abrupt drop of the land towards the lower alluvium of the Kauriala river, which is cut up by numerous short ravines, and bears a forest of miscellaneous trees. The low-lying lands, comprising 67 square miles, are grass lands interspersed with belts of khair and sissu forests mostly on the higher edges of still running or deserted water-courses and with clumps of trees on the somewhat raised portion of the land; they are dotted over with trees of the same description, which here and there escaped flood and fire in favourable localities. Towards the south-west the high-lying alluvium disappears gradually into the lower land, and here we find the sál forest blending into an open jungle of dhak and scrub.

Sál-bearing Blocks.

16. From a purely forest point of view, the sál forest is, under existing circumstances, and with the present state of the demand and market, by far the most valuable, though it is impossible to say what changes may take place in this respect in consequence of the rapid development of railways and other improvements in communications. A general description of the soil has already been given in former paragraphs, and it need only be noted that the covering of decomposed soil becomes deeper and richer in loam towards the hills, and gradually fails towards the south of Motipur.

At Murtiha the sandy loam covers the undecomposed river sand to a depth of 12 to 15 feet, and is still sufficiently deep at Motipur to be able to bear good sál forests, though south of that place it decreases rapidly. I was unable to verify the statements made in former Reports with regard to the inferiority of the sub-soil near the abrupt drop of the high ground, and can ascribe the change in the forest only to the more rapid evaporation and drainage which takes place near the steep slope of the "damar," and to the want of covering by humus and vegetable detritus, which is more readily washed away in these localities. The composition of the Motipur sál forest varies but slightly, though it may be said that Asseina (*Terminalia tomentosa*) forms a larger proportion of the *peuplement*, with an increasing admixture of loam, and preponderates on the Nipal boundary to the north-west of Salarpur. Though, however, the composition is but slightly varying throughout the forest, there is a very marked difference in the character of the present growth in different parts of the forests. The forest in the south-eastern portion, near Motipur, is not as completely stocked with healthy-looking trees as the areas near and north of Murtiha, and is deteriorating under our very eyes in the character of the *peuplement* and continuity of the leafy canopy; topsore and dying poles are numerous, and the ground is covered with a growth of *Holarrhena*, instead of sál reproduction; but, even in the poorest portions, sál is frequently found in rich well-growing groups on low ground and in depressions.

The first impression conveyed to the observer is naturally that the difference in forest growth is entirely due to want of depth and to a worse quality of the soil, which has already been noticed; but a closer examination shows that the comparative inferiority of the forest is mainly caused by constant grazing and fires. The depth of the good surface-soil decreases very gradually, and the changes in the character of the forest should be equally gradual, if this was the sole, or even the main, reason of the difference noted in the forest growth. This, however, is not the case; the change is abrupt, and follows the boundary of the forest areas, which have been continuously protected since 1878; and even those areas south of the Jalia-Salarpur line, which

have only lately been added in 1880-81 and 1884-85 respectively, already show signs of improvement in proportion to the time of protection. I have no doubt that the sál forest at one time extended south beyond its present limits, and the extinction of the tree in the unprotected blocks is, if the forest be left under the present conditions, only a question of time. The soil in these blocks is uncovered by humus, as the dead leaves and other vegetable matter are year by year consumed by fire. Even the covering of grass is sparse, and the small bushes of *Holarrhena* are insufficient to protect the surface, which consequently dries rapidly by evaporation. The sál no doubt sends a powerful taproot deep down in search of water; but its main system of roots lies near the surface, and the tree is consequently sensitive to surface drought and continuous trampling of the exposed soil.

17. The protected compartments in the Motipur sál forest, at least those which have been continuously protected since 1878, are covered with an advance reproduction of such density and completeness that, from a purely forest point of view, the greater part of the old timber could be taken out at once. The present state of reproduction would permit the reaping of the greater portion of the mature crop, and it is only in order to ensure a continuity of the supply that felling is required to proceed gradually. This has been fully recognized, and the fellings as at present proposed and carried out in these compartments leave nothing to be desired. The general plan of treatment is both feasible and practicable. The plan is that where the advance reproduction is complete, all trees overhead are to be felled, with the exception of such sál trees as are quite straight and healthy, and which promise to yield large, sound, and straight timber in the next rotation. None but the very soundest trees are to be spared, and the number to be left is, therefore, dependent on the present state of the forest in each locality. This naturally differs, but on the area already treated the number of sound poles left on the ground averages, according to an eye estimate, from 15 to 30 trees per acre, girthing from 1 to 3 feet.

The advance growth, which is by no means pure sál, but which contains a sufficient number of trees of that species to form a sál forest, is at present to be left undisturbed in its composition, in order to allow of its out-growing the injury caused by the present felling operations, which is naturally in some instances very considerable. After 2 or 3 years, or as soon as the effects of the working have been effaced, it is intended to weed out, as far as necessary, the saplings and young poles of inferior species in favour of the sál. The result of these operations will, if fire-protection continues to be successful, be, after a comparatively short period, the formation of a healthy young pole forest of sál, with vigorous standard trees; and from such forest grazing need probably not be entirely excluded till the time comes round for it to be worked again.

In this way a certain area may, if it be considered necessary hereafter, which I doubt, always be utilized for grazing when the forests shall have once been brought into a healthy state; but at present we must recognize that they still suffer from former bad treatment, and that, in order to re-establish their potential capabilities, a much closer protection must be enforced than may hereafter be necessary.

18. A Working-Plan for the Motipur Forest is no doubt required in order to regulate the exploitation of the forest. In my opinion such a Plan ought to be extremely simple. Reproduction in the protected blocks is so far advanced and so regular, that the formulation of the Working-Plan becomes in the present rotation purely a question of demand at remunerative rates, and all that will be required will be a division of the mature stock in such a manner as to yield a continuous and somewhat even supply till the younger generation has grown up. Extended fire-protection will without doubt result in a complete reproduction throughout the Motipur sál forests. An enumeration of the growing stock will hardly be necessary, and it will probably be sufficient to divide the forests into areas for each year's felling by estimates based on ocular observations only. In this respect it will, however, be highly advisable not to lose the local knowledge of the present Divisional Officer, who has already proved himself to have thoroughly practical views of the object in question. To enable Mr. Dansey to devote himself to the work with sufficient energy, he should have for the time an Assistant able to undertake

the detailed supervision of the works carried on in the Bahraich Division, and to conduct the whole of the Office work.

The development of means of communication and the search for a steady market must continue hand in hand with the preparation of the Working-Plan, so as to ensure a demand up to the ascertained capabilities of the forest. This question has been taken up with laudable energy by Captain Wood, the Conservator, and will, there is now every reason to hope, be eventually solved in a satisfactory manner. The construction of a permanent tramway between Sujauli and Nishangara, with a movable branch from thence into the forest, which should, however, be of the same gauge, will no doubt greatly assist in developing a steady market. In the Changa Manga Plantation, in the Punjab, it has been found that, apart from the cost of the tramway and repairs to it, the actual cost of moving fuel has been less than $\frac{1}{6}$ of a pie per maund per mile.

I have already mentioned that, if present circumstances are allowed to continue in the unprotected blocks, the extermination of the sál tree within them would only be a question of time. If, therefore, the working of the whole Motipur sál forest is to be planned for, it will be essential that the whole area comprising the "damar" should be protected from fire, and at present from grazing as well; for it is impossible to conceive a reasonable and feasible Working-Plan which takes such eventualities as constantly recurring fires into consideration. The motive of such Plan could only be to ascertain how long the forest could resist such treatment.

19. A great portion of the still unprotected compartments in the Motipur sál forest is kept open to serve as pasture grounds for a few unimportant villages situated between the forest and the Sarju river, *viz.*, Salarpur, Murtiha, Ghumna-Bhara, Chitlahua, and perhaps Kakraha-Budhora. An exchange of these lands against parts of the Babai forest, south of Motipur, has been proposed by the Divisional Officer; and, supported by the Conservator, this proposal is, I believe, under the consideration of the Government. These villages are cut off by the Chota Sarju river from all other grazing but that which the forest can afford, which is miserably bad on account of the growth of *Holarrhena*—a shrub which cattle do not eat. The damage done to the forest is, therefore, quite out of proportion to the benefit conferred on the villagers. A strict enforcement of the rights of Government in the Motipur sál forest would make the position of the villagers untenable, and, in my opinion, the proposed exchange is advisable from every point of view. Moreover, the fire-protection of the whole forest will be greatly facilitated thereby. For this latter reason it will also be advisable to exchange, as proposed, a few narrow stretches of land on the west boundary of the forest, including the Kharia and Bhewra-Birghat villages, and two small plots of land belonging to the Angan and Simri-Malmala villages.

The grazing requirements of Motipur and other adjacent villages can be amply provided for in the *boná fide* grazing grounds included in the Dobha and Babai forests, and do not need the assistance of the extremely poor grazing in the still open compartments of the Motipur sál forest.

Khair and Sissu Forests and Grass Lands.

20. The grass lands, as already stated, are so interspersed with belts and clumps of khair and sissu forests that any practical separation, without having recourse to a detailed survey of the larger blocks of forest, is impracticable. The whole area of these forests is subject, or rather subjected, to annual conflagrations in order to produce an early crop of new grass. Under these circumstances, natural reproduction is almost at a standstill, and the compilation of a Working-Plan for these areas is quite useless, for it is essentially wrong to fell, as long as fires sweep the ground, a single tree that is still fit to bear seed; and a Plan devised on any other basis would simply be a Plan by which extermination of the forests would be more or less accelerated.

The present reproduction is so uncertain that it cannot be taken into account; and, if the still existing seed-bearers on these areas are destroyed, nothing but artificial cultivation can restore those lands which are beyond the reach of flood-carried seeds when the time for excluding fires arrives. We

may have some excuse in working protected areas, but no right to assist in the already rapid deterioration of areas subject to annual fires, unless we intend to transform them into purely grass land or to bring them under the plough—a measure which was evidently under consideration when previous Suggestions were framed, which provided that no trees should be felled in blocks closed against fire and grazing, but that fellings might take place in open and unprotected areas.

21. I have not sufficient proof to the contrary, and consequently admit, though I am in no wise convinced, that the whole area of these low-lying lands is at present of greater value as grazing grounds than as forests, especially as their value as pasture grounds cannot be solely gauged by the annual income from grazing fees. It is, however, by no means certain that these conditions thus admitted will remain unchanged. The value of the sissu and khair forests may largely increase by the development of railways, and it may become necessary and feasible to reduce the extensive grass lands. The present wasteful way of reaping a grass crop by grazing and the burning of the surplus grass, which far exceeds that utilized, may give way to a more conservative treatment, by which a much larger number of cattle can be fed from a much smaller area.

The time when such elementary questions, as whether fires within a forest did not, perhaps, do more good than harm, could raise a serious discussion has happily passed away; but in grass lands and forests in which grazing is still considered to be of paramount importance, and when there is not sufficient demand for the whole annual grass crop, fires are still the order of the day, as it is considered necessary to clear the ground of the larger amount of dead grass which is produced over and above the actual requirements.

Where the grass is of sufficient value—as, for instance, near Simla or within easy reach of the Simla-Kalka road—such fires have ceased to exist, and the grass crop has improved instead of deteriorated; and in the Poona District in the Bombay Presidency reserved areas yield revenues paid for the permission to cut grass many times as large as those which were formerly realized by grazing. Captain Wood informs me that, in Gorakhpur and Gonda, cattle are kept out of the grass lands, that the grass is allowed to grow undamaged to its full size, and that it realizes thousands of rupees, where it only fetched hundreds before. It is true that in this instance the grass is principally used for thatching, but still its economic value may fairly be gauged by the amount realized on account thereof. The more conservative utilization of the enormous grass crop in all the low-lying Forest Reserves in Oudh is only a question of time and advancing civilization; but, as long as the (at present) more valuable sál forests are strictly protected throughout, and as long as no privileges are recorded, which at some future time might form an artificial barrier to a development of a more rational treatment of the present low-lying grass lands and sissu and khair belts, I do not advocate any further wholesale and sudden reformation either with regard to grazing or fires. It will, however, be necessary to close and artificially protect against fire certain selected areas, in order to study the effect such closure will have on forest reproduction, and I would advise that the closing of the whole of the north Bhartapur block be considered. This block of the Forest Reserve is situated to the north of the village of that name, and between the Girwa and Kauriala rivers. If considered necessary, a certain amount of grazing ground might be left for the village of Kates, which, however, is situated on the Nipal frontier, and should be able to find ample pasture in that country. The area proposed to be protected is in the immediate vicinity of water carriage to the markets of the plains, and its produce will therefore be of special value. The same proposal, as is now made, was placed before Government on a somewhat smaller scale by Dr. Brandis, the late Inspector General of Forests, in his Suggestions of 1881; but practical effect was not given to his advice.

22. In order to create more compact forest blocks, and to secure the possibility of a more efficient control, especially over grazing, it has been proposed to exclude the village lands of Khar Khanwa from the Dharmanpur Reserve, and those of Dhakia and Jamunian from the Chahlua Reserve, by voluntary exchange. If such exchange can be effected, the arrangement will be of great value to the Forest Department in facilitating the management of the blocks in question. There are other proposals regarding exchanges of land in the

Bahraich District, which the local Forest Officers consider desirable; but with these I am not personally acquainted. The accompanying map shows the proposed exchanges in the district, as well as the areas which it is desirable to fire-protect and close at once, for those parts of the Bahraich District which I have visited, apart from those which I had no opportunity of seeing.

V.—Kheri Forests.

23. The Kheri Forest Reserves contain about 263 square miles, of which 150 square miles are classed as sál forest, 20 square miles as sissu and khair forest, 13 square miles as miscellaneous forest, and 80 square miles as grass lands.

The most important are the sál forests, which here again occupy the high ground—the stable alluvium—between the Mohan river and the Sarda, or, to be more accurate, the Suheli, which during a great part of its course evidently formed once the bed of the Sarda.

The sissu and khair forests, which are of very much the same character as those comprised in the Bahraich Reserves, occupy the low ground on both sides of the Suheli; and the miscellaneous forest is found chiefly on the low, but more or less stable, lands on the Kauriala river, both north and south of the Ramnagar ferry. To separate more accurately these different classes of forests, a survey will some day be necessary.

Sál Forests.

24. The Kheri sál forests extend from Bibrain to Gaurighat on the Nipal frontier, a distance of about 31 miles, and have, excluding the open ground on the Mohan river and the depression in which the Mujhla and Badhi Tals are situated, an average breadth of about 7 miles. The forest does not, however, form a continuous belt like the sál forest in Bahraich, but includes numerous open plains covered with high grass, locally known as "phántas." The Sarota, Bajahi, Phulwaria, Sonaripur, and Barbatta phántas are of considerable extent, and contain hamlets and a certain amount of cultivation belonging to the estate of the Raja of Singahi.

In addition to these large phántas, the forest is honeycombed by smaller glades, varying from a few acres in extent to upwards of a square mile, sometimes following an old deserted river-bed in the shape of a narrow belt, at others forming a more compact area round a swamp or lake. The origin of nearly all these phántas is a depression with insufficient drainage, in which the water remains standing, forming jheels or swamps, or in which it collects, at least during the rains, and remains till evaporation and absorption, assisted by a sluggish drainage, dry the ground. These conditions are death to the sál tree. There is no doubt that the further extension of the *phántas* into the *boná fide* forest area was in many instances due to a sort of *jhúm* cultivation practised by the Thárus, a forest tribe who settled round the more permanent jheels, which supplied them with the water required for their rice cultivation. That these people moved from place to place is clearly proved by clumps of mango, pipal, and bargad trees and groves of guavas, frequently miles away from their present location; but to what extent they destroyed once existing sál forest it would be impossible to ascertain without a detailed inspection of the country during the rains, for even taking the levels of the phántas would not suffice without the most accurate study of the area draining into each depression, and the outlets from each jheel.

It is beyond doubt that a considerable area of the existing moist phántas never did produce sál, and under unchanged conditions cannot produce it.

25. The soil throughout the forest is, as in Bahraich, a sandy loam, formed by a mixture of sand and decomposed mica-schist, varying in depth and degree of decomposition, and highly capable of rapid improvement under continuous protection. I have been unable to trace the same gradual change in the depth and quality of the soil as in Bahraich, and probably it does not exist on the same scale, for the numerous old river-beds and accentuated depressions show that the formation of the Kheri alluvium has, under the influence of two large rivers debouching from the hills comparatively close to each other, been much less regular in its progress.

26. The existing sál forest varies considerably in the character of its composition. Near the edge of the "damar," the intermixture of miscellaneous species is, as in Bahraich, frequently greater than in the heart of the forest; and in other localities asseina forms a large proportion of the present *peuplement*.

The intermixture of the different types of forest is too intricate to follow in a general description, and must be dealt with at some future time in a descriptive account of each compartment; but, on the whole, the sál largely preponderates everywhere over the aggregate of all other species.

The forest varies in the character of its growth even more than in type. The best mature sál forest, locally known as the Mohán Sál Forest, is found on the sloping ground which stretches north-east of the depression in which the Mujhla and Bádhi Táls are situated; and throughout the Reserve the best grown trees of this species were observed on ground inclining gently towards a depression or phánta. In these localities the sál forest is also, as a rule, purest in its composition. It will be the purpose of the working-plan, which is at present under preparation, to separate, in its description of compartments, the more favourable localities from the general type of the forest, but it may be stated that they are by no means as extensive as is usually supposed. There are some fine stretches of forest between Chándpára and Gaurighát of a somewhat similar character to those near Mujhla Tál. To what degree the difference of the forest in type as well as growth is due to variations in depth and quality of soil, and to conditions of drainage, and to what extent to former treatment, and especially to fires, requires a closer study than I have been able to bestow; but I feel certain that the latter have done more to influence the present conditions than all the other causes combined. The well-drained areas (where the forest now shows at its best) produce, even where entirely exposed, a less dense crop of grass than the level ground, and forest fires must have always been of a less fierce character in such localities, and the trees on the slopes had therefore always special advantages in their fight against adversities.

The absence of anything like a complete crop of sound second class trees and poles throughout the greater portion of the forest tends to support the view that forest fires are the main cause of the patchy character of the forest growth. Their hurtful influence is everywhere discernible, but wherever they have been kept out for a number of years, though even occasional conflagrations have taken place, the growth of sounder poles shows that even injured young sál trees have a great power of recovery.

Advance growth is also, as a rule, abundant in those areas from which fires have been excluded for a longer period, though almost wanting in areas which were burnt through after the protection of one or a few years only, when the growth of grass, which had been stimulated by the exclusion of fire and the closure to grazing, added additional fuel to the flame. The high grass springing up during the first years of fire-protection also renders it difficult for the tree-seed to reach the ground and to fix its rootlets in the soil. When advance growth has once taken possession, the grass rapidly gives way to complete reproduction; but under the influence of occasional protection only, varied by fire, reproduction cannot, and does not, take place. The appearance of young seedlings is consequently often more plentiful in open forests than in a considerable proportion of those closed compartments which were protected in name only, and which have suffered in reality from repeated conflagrations. The mass of seedlings, frequently observable in the more favourably situated portions of the open forest, is, however, only created to be destroyed again by fire and grazing; or, if any of the young plants escape, as a small percentage always will under exceptional circumstances, they bear the germs of future disease from their very infancy.

Where a somewhat more healthy reproduction of upwards of a year old, or advance growth, is observed in an open forest, closer examination will invariably show either that the area has accidentally escaped conflagration for several years, or that the growth of grass is for some local reasons very open and sparse.

27. The foregoing remarks show that the safe and certain guidance and management of sál reproduction in a forest with a tendency to grow dense and high grass is a problem of considerable difficulty. It is beyond question that continuous fire-protection will, as a rule, ensure sooner or later, by a gradual reduction of the grass crop, the wished-for result; but it is desirable that the end should be attained more speedily.

I am of opinion that the most serious mistake made in this respect is, the felling in forests before they are closed against fires and grazing; for it is highly desirable that the sál reproduction should be established before the dense grass crop, which invariably follows a fire in a forest with open canopy, takes possession

of the ground; but I shall return to this subject in the paragraphs containing my suggestions regarding the proposed future treatment of the Kheri sál forests.

Next to sál, asseina is the most valuable, and in a great part of the forest the most numerously represented, tree. The mature trees are, as a rule, more healthy than sál, proving an even greater power of resisting fires; but as regards advance growth and reproduction, the same remarks apply, as have been made with reference to sál. Excellent sál reproduction is frequently found under a mature forest of which asseina forms a large or preponderating proportion. This is due to the height of the leaf canopy above ground, and to the fact that asseina is out of leaf when the sál seed drops and germinates.

28. In order to be able to gauge more accurately the effects of fire-protection on reproduction, I have prepared the following table detailing the results of fire operations from 1873 up to date:—

Fire-Protection in Kheri (Trans-Sarda).

Number of Compartment.	Area of Compartment, in acres.	Years.												
		1873.	1874.	1875.	1876.	1877.	1878.	1879.	1880.	1881.	1882.	1883.	1884.	1885.
19	506	0 0	*b*	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
20	2,054	0 0	*b*	0 0	0 0	0 0	0 0	*b*	0 0	0 0	0 0	0 0	0 0	0 0
21	838	0 0	*b*	0 0	0 0	0 0	0 0	*p b*	0 0	0 0	*b*	0 0	*b*	0 0
25	1,114	0 0	*b*	0 0	0 0	0 0	0 0	0 0	500*b*	0 0	0 0	0 0	0 0	0 0
26	1,165	0 0	*b*	0 0	0 0	0 0	0 0	*b*	0 0	0 0	0 0	0 0	0 0	0 0
27	973	0 0	*b*	0 0	0 0	0 0	0 0	*b*	0 0	0 0	*b*	0 0	0 0	0 0
30	269	0 0	*b*	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0	0 0
31	237	0 0	*b*	0 0	0 0	0 0	0 0	*p b*	0 0	0 0	0 0	0 0	0 0	0 0
32	365	0 0	*b*	0 0	0 0	20*b*	0 0	*b*	0 0	0 0	0 0	0 0	0 0	0 0
22	1,926	...	...	...	...	0 0	640*b*	*b*	0 0	0 0	*b*	0 0	*b*	0 0
28	320	...	...	...	...	0 0	0 0	*b*	0 0	0 0	*b*	0 0	0 0	0 0
29	1,574	...	...	...	...	...	...	...	0 0	0 0	...	0 0	0 0	0 0
33	1,306	...	...	...	...	...	...	...	0 0	0 0	*b*	0 0	0 0	0 0
37	307	...	...	...	...	...	...	...	0 0	0 0	0 0	0 0	0 0	0 0
38	416	...	...	...	...	...	...	...	0 0	0 0	0 0	0 0	0 0	0 0
39	1,817	...	...	...	...	...	...	...	0 0	0 0	*b*	0 0	0 0	0 0
40	832	...	...	...	...	...	...	..	0 0	0 0	0 0	0 0	0 0	0 0
41	685	...	...	...	...	...	...	...	0 0	0 0	*b*	0 0	0 0	0 0
42	1,190	...	...	...	...	...	...	...	0 0	0 0	0 0	0 0	0 0	0 0
43	1,395	...	...	...	...	...	...	...	0 0	0 0	0 0	0 0	0 0	0 0
48	3,091	...	...	...	...	...	...	...	...	0 0	0 0	0 0	*b*	0 0
49	307	...	...	...	...	...	...	...	...	0 0	0 0	0 0	*b*	0 0
50	2,195	..	...	...	...	...	...	...	...	0 0	0 0	0 0	*b*	0 0
53	3,076	...	...	...	...	..	...	...	...	0 0	0 0	0 0	*b*	0 0
54	1,875	...	..	...	...	...	...	...	...	0 0	0 0	0 0	*b*	0 0
55	2,080	...	...	...	...	...	...	..	...	0 0	0 0	0 0	*b*	0 0
57	1,754	...	...	...	...	...	...	...	...	0 0	*b*	0 0	0 0	0 0
58	678	...	...	...	...	...	...	...	...	0 0	*b*	0 0	0 0	0 0
61	2,372	...	...	...	...	...	...	...	..	0 0	0 0	0 0	*b*	0 0
62	3,360	...	...	...	...	...	...	...	...	0 0	0 0	0 0	*b*	0 0
15	915	...	...	...	...	...	...	...	...	0 0	0 0	0 0	0 0	0 0
16	832	...	...	...	...	...	..	...	...	0 0	*b*	0 0	0 0	0 0
17	1,158	...	...	...	...	...	...	...	...	0 0	*b*	0 0	*b*	0 0

0 0 = Successfully protected.
b = Wholly burnt.
640*b* = 640 acres burnt
The year 1873 means the year reported as in 1872-73 up to the rains of 1873.

I regret that I did not compile this table immediately on entering the forest; but the necessary detailed data were only available at the divisional head-quarters; but I can state from subsequent personal observation that compartments 15, 19, 20, 25, 26, 30, 31, 40, 42, and 43 show by far the best advance growth and the largest number of young plants. This would seem to indicate that a protection of five successive years causes a reproduction and advance growth strong enough to recover from, if not to resist, an occasional conflagration. My examination of compartments 40, 42, and 43 was only superficial.

29. As regards the success of the measures hitherto adopted for fire-protection, the above table discloses very unfavourable results, the reasons of which must be carefully sifted.

The area over which fire-protection is at present attempted, as shown on the accompanying map, amounts to about 66 square miles, and is divided into two unequal parts by a fire-line ½ mile in breadth. These blocks are again subdivided by a system of interior fire-lines along those roads which are kept open for traffic during the dry season from March to June. As soon as the grass in the outer phántas is sufficiently dry, they are burnt, and the forest is thus far isolated. As the season advances, the interior grass lands are burnt. Why this should be done is not quite clear to me; for, as cattle are excluded from them, they are evidently not a source of danger, and, on the other hand, the extension of the sál forests up to their natural limits is checked by the annual burning. It will be seen that the general arrangements are on the side of over-caution rather than otherwise, and the reasons for the frequent fires must be looked for elsewhere. Two most extensive fires have been caused—one by our own cartmen employed in taking timber out of the forest; the other by the burning of a grass hut, the home of one of our fire-watchers. These of course are accidents, but they have cost us dear, and seem to indicate, firstly, that, if otherwise feasible, a greater concentration of all timber works is desirable, as this would facilitate supervision of the workmen; secondly, that all buildings of an inflammable character should be replaced by others, or, if this cannot be done at once, that small cooking-places with brick walls should be built near each guard's or fire-watcher's hut, and that fires for cooking or smoking should only be allowed within these fire-proof places. This year, I am informed, two small fires occurred—one due to the sawyers, and the other to the cartmen who take our sleepers to the depôts. The camping grounds of these men are by far too many, too scattered, and consequently often insufficiently fire-traced.

The forest fires are, however, even more frequently caused by graziers, who are permitted to enter the open unprotected compartments with their cattle and buffaloes, and who deliberately fire the grass within them; and not at a time when only open phántas will burn, but in a season when the grass in the whole forest is sufficiently dry to permit of a general conflagration. In fact, these fires are kindled with the intention of producing a new crop of grass in the forest. I have already mentioned, in a previous paragraph, that I saw fire being set to the north-west edge of the Kheri forest, containing some of the most valuable sál-growing compartments, in order to produce fresh grazing for less than one score of buffaloes, and which they would use for a few weeks only. I am convinced that the grazing of these few buffaloes annually costs the State a good many thousand rupees in the loss of the productive power of the forest. These fires, which, as already stated, are lighted at a time when the whole forest is inflammable, are in no way directed or confined, and may with a high wind be carried through many compartments, and cross over into the fire-traced block; for isolation within the forest is, owing to the difficulty of keeping the fire traces under the trees clear of grass and dead leaves, rarely as efficient as if the whole forest were closed and protected. Four or five distinctly separate fires were caused in this way in the fire-protected compartments near Phulwaria since fire-protection by the isolation of certain compartments was attempted. To permit the continuation of such treatment of valuable forest areas is tantamount to sanctioning their utilization in a manner which eventually must rob the everlasting community of the State of the permanent benefits derivable under a conservative treatment. I would, therefore, advise that the whole of the Kheri Forests actually under sál be declared closed against grazing and be protected from fires. It may be quite feasible to permit grazing in certain localities or at certain seasons as long as no fires are caused; but during the dry months the forest should be closed entirely.

30. I have no doubt that it will be easy to isolate and protect the whole area of the Kheri sál forest, and this is what I propose. The forest should be divided into six fire-blocks by cleared lines ¼ mile broad, similar to that which divides the present fire-protected area into two parts. I have entered the proposed division on the accompanying map. In this I have mainly considered the shortest lines which would connect large phántas on which the grass can be burnt early in the season, and I think they will be found suitable on this account; but if the proposal is accepted in principle, the ground should be carefully re-examined and due consideration should be given to the fact that extensive fire-lines are, if other circumstances are the same, more efficient if they run in the same direction as the prevailing wind, for a fire carried before the wind crosses more easily a fire-trace vertical to the direction in which it moves.

Block I would contain compartments 1 to 14, 16, and 17.

Block II—compartments 15, 19, 20, 25, 26, half of 27, 30, 31, 32, and part of 33.

Block III—compartments 18, 21, 23, 24, half of 27, 28, 29, 34, 35, 36, 45, and part of 46.

Block IV—compartments 33 (part) and 37 to 43.

Block V—compartments 48, 50, 53, 55, 57, 63, 66, 67, 72, and 73.

Block VI—compartments 36, part of 46, 47, 51, 52, 56, 64, 65, 68, 69, 70, 74, and 75.

The interior roads used for traffic should be fire-traced as usual, and the large phántas should be burnt; but in order to permit the sál forest to gradually gain on the phántas, as far as nature will permit, a narrow trace should be cut early in the season, a chain or two from the existing forest, and the firing should, as far as possible, be done towards the open. It is true that at the time, when phántas are burnt, the grass inside of the forest is sufficiently green to arrest the progress of the fire; but, nevertheless, the trees along the outer edge are more or less scorched, and the spread of seedlings and young growth is checked unnecessarily. When a belt of young growth has been produced, the fire-trace should be moved further into the phántas.

31. To ensure success to the extended fire-protection proposed, it is essential that all the enclosed phántas should be under the entire management of the Forest Department, and the acquisition, by exchange, of those which belong to the Raja of Singhai has been recommended by the Conservator. This proposal seems to me highly commendable, especially as it is not the intention to withdraw these lands, from the areas available for grazing. It is proposed to dig, where necessary, wells or tanks in suitable places within all such phántas that are extensive enough to support a herd, to erect sheds round the wells, and to place, after the phánta has been burnt by the Forest Department, a respectable grazier in charge, who will be held responsible that no fires are lighted but near the settlement, and that his cattle do not stray into the forest. These men would be bound down by a few simple, but strict, rules, and if they once understood that they and their herds would have to leave the phánta immediately a fire occurred on its outskirts, and that they would forfeit the grazing fees they might have paid, they would soon serve as a protection to the forest instead of being a source of danger.

Former Forecasts.

32. Several forecasts regarding the working of the Kheri sál forests have been compiled from time to time, of which the following is an epitome:—

"The sál forests between the Sarda and Kauriala, which had been surveyed and demarcated, aggregated upwards of 150 square miles, and the growing stock on this area was estimated at first to be 330,750 first class and 559,500 second class trees.

"Pending further observations, the rate of growth was assumed to be as follows:—

	Girth.				Years.
Age at	1½′	...	...	...	15
"	4½′	...	...	...	50
"	6′	...	...	...	80
"	9′	...	...	...	150

"The time required for the second class trees to obtain marketable dimensions was therefore 30 years; but, in order to be on the safe side, this period was taken as 40 years, and the maximum annual yield was fixed at 8,000 trees. The forest was to be divided into ten sections, to be worked in rotation, so that the whole yield would be removed in one year from one section only.

"Present fellings were to be restricted to 4,000 trees annually, only one in four of the first class trees being felled. The cuttings were to proceed regularly from east to west, and not more than ten square miles were to be cut over in one year. Under this arrangement, the annual outturn was estimated at 200,000 cubic feet, and the gross and net revenues at Rs. 1,00,000 and Rs. 50,000, respectively.

"Two-thirds of the sál trees were found to be covered with creepers, and it was proposed to expend Rs. 3,000 in cutting them.

* * * * *

33. "The above proposals were revised in 1868, and the new arrangements, which were to hold good for two years, were detailed in a joint Memorandum by Mr. Brandis and Captain Wood.

"Since 1861 altogether 12,000 trees, principally sál, had been felled, but the fellings had been scattered over different parts of the forest, and not confined to one locality.

"Surveys extending over 177 acres had been made in 1867, and showed the average growing stock per 100 acres to be as follows:—

				Asseina	Sál.
First class trees, 6′ girth and above	...	...	...	70	290
Second class trees, 4½′ to 6′ girth	...	...	...	120	350
Third class trees, 3′ to 4½′ girth	...	...	...	480	980
Fourth class trees, 1½′ to 3′ girth	...	...	...	720	1,970
		Total	...	1,390	3,590

"But about two-thirds of the first class trees were too unsound to yield marketable timber. It was therefore proposed to fell in future all sound first class trees instead of only one in four, as the unsound trees would, as a rule, be sufficient to furnish seed and shelter to the young growth.

"Captain Wood was of opinion that there were, on an average, eight concentric rings in each inch of radius near the centre of the sál tree and ten in the outer portion, and he assumed that the average age of a tree 4½′ girth was 65 years, and of a tree 6′ girth 95 years; but, considering the uncertain data on which these surmises were founded, it was proposed to take 40 years as the difference in age between a first and a second class tree.

"It was estimated that the forest contained a total number of 345,600 first class sál and asseina trees, of which 115,200 were fit for removal. These, distributed over a period of 40 years, gave 2,880, or in round numbers 3,000, trees as the annual yield.

"The areas cut over were to be protected from fire by burning a belt round them early in the season. Thinnings were to be undertaken wherever found necessary, and creeper cutting, which had been already commenced, was to be completed in all parts of the forest.

"The sissu tracts contained little or no mature timber, and no Plan was made for working them.

"Two main lines of division had already been cut, and a third line was to be cleared, so that the forest would be split up into four sub-divisions. Minor lines were to be cut at right angles to the main lines, so as to form compartments, and all lines were to be cleared sufficiently well to be used as fair-weather cart-roads.

34. "Early in 1870, a plan of improvement-cuttings to be carried out during the years 1870-71 and 1871-72 was drawn up by Captain Wood, in addition to that lately expired, which was permitted to run on. Fellings of sound green timber were to be carried on at the same rate as heretofore, but the areas in which these fellings had been conducted were to be located block by block, by coppicing all unsound sál trees, and cutting out and converting into scantling or fuel all dead trees and trees of unreserved kinds, 1½ feet in diameter and above.

"The second and third class trees were to be thinned out where necessary, and each block taken in hand was to be protected from fire and grazing.

"These improvement-fellings were not carried out until 1874-75, when 82 acres of rather poor forest were treated as above proposed. The outturn was 8,331 cubic feet of sawn timber and 125,000 maunds of fuel, equal to 100 cubic feet of sál scantling and 1,500 maunds of fuel per acre.

35. "In 1879-80 the number of trees to be felled was reduced to 2,000 per annum.

"In the following year Captain Wood having reported that the forests were not being worked to the extent they might be, Mr. Brandis was called on to state his views on this point.

"Captain Wood's proposals were as follows:—

"*1st.*—That a much larger proportion of trees yielding marketable timber should be felled.

"*2nd.*—That, in addition to marketable trees, all unsound and crooked trees should be felled and utilized as far as possible.

"The conclusions arrived at by Mr. Brandis were:—

"*1st.*—That the outturn in timber of the Trans-Sarda Forests (on an average 3,000 trees per annum during the past 11 years) was only a small portion of what they might yield if protected from fire.

"*2nd.*—That, as long as they could not be protected, it was desirable to cut as little as possible, as the growth of high grass (that would be the result of letting light into the forest) would intensify the damage done by fire and considerably increase the difficulty of future protection.

"*3rd.*—That, in forests not protected from fire, selection-fellings at the rate provided for in the Plan of 1868 must be adhered to, but that, in tracts secured from fire, cuttings on the plan commenced in 1874-75 should be steadily continued, provided that they proved financially successful.

"*4th.*—That, after fire-protection had been fully established, the forests should be worked to their full extent, and the cutting out of mature timber should only be regulated by the necessity of leaving trees to shed seed where young growth was wanting, and by the consideration of maintaining a sufficient annual supply of timber until the younger classes of trees should have attained maturity.

"*5th.*—That, as a preparatory step, valuation surveys should be made whenever opportunities for so doing presented themselves; also that the rate of growth should be determined by annual measurements of standing trees, and that attempts should be made to determine the annual rings in saplings of known age.

36. "Mr. Brandis again inspected these forests in 1881, and drew up proposals for their future working.

"The result of the experimental improvement-fellings made in 1874-75 showed that, wherever a complete clearance had been made, the first result was always to increase the quantity of grass on the ground and thus augment the risk from fire. The growth of young sál was without doubt promoted by abundance of light, but it was considered safest in the first place to kill the grass out as much as possible, by increasing the overhead cover and by continued fire-protection. As soon as any blocks or compartments should have been completely filled up with young growth, it was recommended that all marketable trees should be cut, and unsaleable trees other than sál killed by girdling. The proportion of asseina trees was to be diminished by allowing villagers to help themselves, free of charge, to poles of this species, and by thinning them out on Government account.

"It was proposed, for the present, to continue the selection-fellings outside the 65 square miles demarcated for fire-protection. In the latter, no cuttings of green timber were to be allowed, except hollow trees for boat-hulls.

"The selection-fellings during the past 20 years had yielded about 50,000 mature trees, and the fellings had extended over the whole northern portion of the forest, or over about 70 square miles, so that the yield per mile had been about 714 trees.

"The northern part of the forest, of which 40 square miles were outside the area proposed for protection, had been worked out before it was taken charge of by the Forest Department; and it could not be expected to yield more than 350 trees per square mile.

"The forest to be worked in the immediate future comprised, therefore, an area of 40 square miles, estimated to contain 14,000 marketable trees. It was proposed, during the next five years, to fell 2,500 green sál trees per annum, and then, if necessary, to take a few years' more yield from the northernmost blocks, where felling had been carried out 10 years previously.

"In this manner it was estimated that the needful annual outturn would be provided for at least eight years, commencing from 1881-82, without having to cut in the fire-protected areas.

"All marketable sál trees, 6′ in girth and above, were to be cut, except those standing at the edge of blanks or in places where no seed-bearing sál trees were near, and the fellings were to proceed progressively and in due order, no new compartment being taken in hand till the cuttings in that previously worked had been completed.

"As soon as fire-protection had been fairly established, a summary descriptive account of each compartment was to be drawn up. Under the term 'compartments' was understood all plots separated from one another by cleared lines, of which a very perfect system had already been laid through the whole of the forest. Some of these compartments were inconveniently large and would require further subdivision.

37. "The following is a comparison of the actual working of the Trans-Sarda Forests with the sanctioned Plans :—

1863 to 1866-67.

Proposed Departmental fellings	Actual fellings, 1861 to 1866 67
28,000 trees (sál).	12,000 trees (sál).

CREEPER CUTTING.

Proposed	Work done, 1864 to 1867 68
Rs. 3,000 per annum to be expended in cutting creepers over an area of 60 square miles.	About 150 square miles cleared at a cost of Rs. 14,612, or Rs. 98 per square mile

1867-68 to 1880-81.

	Proposed fellings	Actual fellings.
1867-68 to 1878-79, 12 years, at 3,000 a year ...	36,000 ..	33,130
1879-80 and 1880-81, two years, at 2,000 a year	4,000 ...	3,973

Under the forecast of November 1881, which permitted selection-felling of 2,500 green sál trees annually, the following fellings have taken place :—

Year.	Departmental Operations.				By Purchasers.	
	Sál.		*Asseina.*		*Sál.*	*Asseiná.*
	Selection fellings.	Sleeper fellings.	Selection fellings.	Sleeper fellings.		
1881-82	2,528	...	531	...	...	...
1882-83	2,500	8,712	...	...	783	628
1883-84	2,537	30,480	...	4,250	453	826
1884-85	2,551	0,739	431	822	403	2
1885-86	2,500	10,760	...	9,081	...	...
Total ...	12,616	56,691	962	14,163	1,639	1,456
Total Sál trees ...			70,916			
Total Asseina trees ...			16,580			

The annual outturn during this period amounts consequently to—

14,189 sál trees,

3,316 asseina trees.

38. It has been sought to defend the excess cuttings of this period by balancing them against short fellings previous to the date of revision; but this is not admissible, for each new revision is based on data as they appear at the time, and therefore already takes previous short fellings into consideration when fixing the annual outturn. On the other hand, the forecast of 1881 takes only the thoroughly sound timber-yielding trees into account, as there was no market at the time for unsound or crooked timber, which would only yield scantlings of small dimensions, and there was no demand for asseina. Captain Wood was consequently quite right in grasping the opportunity of a sudden demand for railway sleepers, provided it can be shown that the recent fellings were justifiable from a sylvicultural point of view.

In considering this question, the point must not be lost sight of that the construction of the railways enhances the value of the forest property to a considerable extent; and even should it be proved that the recent fellings were beyond the annual capabilities of the forest, which is doubtful, or that they were otherwise somewhat injudicious, the exceptional circumstances of the case warranted exceptional measures.

The selection fellings have been kept within, or at least sufficiently near, the provisions of the forecast of 1881. With the principle of these selection fellings outside the protected areas, which was laid down in paragraph 99 of the forecast of 1881, I cannot agree; for it is bad forestry to attack, however leniently, a forest which we cannot protect and which we do not intend to abandon. The blanks caused in open forests by such fellings have a tendency to increase under the influence of annual fires, rather than to be filled up by young growth; and, as a rule, the finest forests are the natural fields of such selection-fellings as prescribed, where selection means only a search for the best timber trees. In addition to the principle being wrong, the fellings have not always been carried out with due regard to the proviso that no trees were to be felled on the edges of blanks.

39. Previous experiments to utilize and export inferior trees in the shape of small scantling had resulted in failures, and the only forest produce that admitted of remunerative extraction, even as late as 1881, was sál timber in the log. No provision was consequently made in the forecast of that year for the utilization of any but large timber-yielding trees. Then came the demand

for sleepers, causing the exploitation of 56,691 trees. The sleeper fellings have to a great extent been confined to closed blocks, but they have also been extended to open forest near Bilraien and Badhi Tál. The trees felled for sleeper cutting, though inferior and malformed and unfit to yield timber, were, as a rule, selected for their soundness in order to obtain the largest possible outturn; but, nevertheless, they averaged only about eleven sleepers per tree, and the forest is filled with worthless wood and branches, for which there is no present market.

As already said, the trees felled for sleepers could under no circumstances have yielded long timber or scantlings, and in so far no loss has been experienced by their exploitation; but the fellings for sleeper operations, following the selection-fellings prescribed by the Working-Plans, resulted in a considerable reduction of sound seed-bearers.

In the fire-protected compartments this is, in my opinion, of no injurious consequence, and from a purely forest point of view is rather beneficial than otherwise; for a sufficiency of seed-bearing trees have been left, in every locality I inspected, to ensure reproduction, and this will in such places be stimulated by the opening out of the forest. If fires are successfully kept out, the enormous quantity of dead wood now lying in the forest will, moreover, not be lost, if the demand for firewood expected to arise in consequence of the railway construction becomes a reality.

In all open or unprotected forests, subject to annual conflagrations, sleeper operations are an unmitigated evil, and largely magnify the injuries already effected by the much more lenient selection-fellings, and here the large quantities of dead wood must largely add to the destructiveness of forest fires. Till fire-protection is therefore extended to them, all exploitation of these unprotected areas ought to cease. The rule that no seed-bearing trees should be felled on the very edges of blanks and phántas has here again not everywhere been sufficiently attended to.

40. The extraction of asseina trees, which of late has assumed considerable dimensions, is in consonance with the recommendations made in former Reports and Suggestions. At the time when the wholesale extraction of this tree was recommended, it had no particular value, and was naturally regarded as a component part of the forest, which it was well to get rid of in order to make place for sál reproduction. The conditions have since altered, and asseina, though still much less valuable than sál, is no longer valueless, as it was a few years ago. I have, however, even now no objection to offer to the extraction of mature asseina trees in fire-protected blocks without much reference to the number of first class trees available, as long as it is remunerative; but no fellings of this tree even should take place in unprotected compartments.

I append for reference a table (Appendix B) showing, in as great detail as it is now possible to ascertain, the number of trees felled in the Kheri sál forest, and the localities where such fellings took place.

Working-Plan and suggestions regarding it.

41. The Kheri sál forest contains, as already stated, 146 square miles, or 93,440 acres. This area comprises, however, all the less important phántas, and we may accept the area actually under sál forest to be 80,000 acres. This figure will suffice for the present object, which is intended only to illustrate my views regarding the general purpose of the Working-Plan, and not in any way to interfere with its actual compilation, which must be based on more accurate data than are as yet available, and for the collection of which an interior survey of the sál forests is one of the first steps required. Such survey might, with the permission of the Local Government, be undertaken by the Forest Survey Branch in November next, as part of the instruction of the students at the Forest School at Dehra.

42. A forest of the extent indicated, and situated like the Kheri Forest, should, if protected throughout and brought into complete working order, yield probably four times the number of trees that it has done on an average even during the last five years; and to enable it eventually to produce such yield should be the aim of the Plan now under preparation.

I have already pointed out that the forest cannot be worked up to any approximation of its powers, or with due regard to its improvement, as long as fires are not an exception instead of a rule, and I assume that the whole forest will be brought under fire-protection, to which it is entitled by its importance. This is a question which should be decided without delay, for it is futile to prepare a Working-Plan for compartments which are annually burnt, and in which the felling of every additional tree is a new source of danger and injury.

43. The North-Western Provinces Working-Plans Officer started work in the Kheri Forest during the end of November last. In the first instance the compartments were examined; were then separated into the different types composing each compartment, and sample plots of each type were accurately counted out. This was done with the hope of being able to deduce from the facts thus ascertained sufficiently accurate estimates for the whole of the compartments, and eventually for the whole of the forest. By a comparison of the results thus arrived at with the figures obtained from actual enumeration of the whole stock growing in the same compartments, it was, however, soon ascertained that the forest growth in Kheri was so irregular, and varied so frequently and abruptly, as to make an enumeration by sample plots quite unreliable; and it was considered necessary, in order to ensure the requisite degree of accuracy, to continue work by making a complete enumeration of the growing stock. In this way some 6,000 acres were counted out. The results, as far as they go, show the existence of 1·10 sound and mature sál trees per acre and 2·67 unsound trees. The enumerations took place in forests which had been traversed by both selection and sleeper fellings, and the results show that if the former estimates, which were not, however, based on complete enumerations, were trustworthy, no appreciable deterioration has since taken place in the number of mature trees, but also that there has been no improvement in the quantity of mature stock on the ground. Considering, however, that the fire-protected forests have vastly improved as regards sound poles and advance growth, it cannot be argued that they have been overcut.

I do not think that it will be possible to draw a satisfactory conclusion for even the whole fire-protected forest from the data obtained in only one part of it, and the results cannot certainly be used with regard to the open compartments with any degree of reliability. It is therefore a question to be considered whether the whole forest is to be enumerated, or whether we shall trust to somewhat extensive linear valuation surveys. The question is one of time and cost on the one side, and of the amount of accuracy required on the other. The progress made in the enumeration during the last season is no criterion of what can be done; for much time was spent in the selection and survey of types, which of course may be dispensed with when a complete enumeration has been decided on. I am convinced that the work could be completed during the next season.

44. The amount of accuracy required depends on the system of management contemplated by the Working-Plan, which is again contingent on the demand and market. As long as a demand existed only for sound sál timber of large dimensions, probably no other system was adaptable than that devised and prescribed in previous forecasts, which has, however, no other commendation than that it was necessary under the circumstances, and which can be called "selection-fellings" (*Jardinage, Plaenterwald*) only by a far-stretched courtesy, for the trees were not selected from a sylvicultural point of view, but from a purely commercial standpoint. A safeguard against deterioration of the soil is only to a small extent ensured by this method even in fire-protected forests, for it is doubtful whether the removal of single trees here and there always disturbs the canopy overhead sufficiently to permit of a complete reproduction, and if this does not result, the leaf cover is unnecessarily interrupted.

The demand for sleepers has changed the aspect of affairs in some measure, and, if all first class trees were fit to yield them, it would probably have allowed of the application of a more sylviculturally correct process of *Jardinage*. Again, however, only a small proportion of the trees were adapted for sleeper cutting, and selection depended again more on the character of the individual trees than on the necessity of the forest, which lost no doubt many seed-bearers where their existence was at least desirable; for scarcely any other

consideration than the fitness of the tree for the purpose in view seems to have guided the selection, which again only too often extended to the very outskirts of the phántas. As a matter of fact, it would be almost impossible to exercise a useful supervision over fellings carried out on a principle like that under discussion. . Still, as long as the present conditions of the market remain unaltered, it will hardly be possible to change the system, which has been forced on us by circumstances, under which the working of the forest must be based entirely on the amount of marketable growing stock throughout the forests, and its rate of growth. The work cannot be sufficiently concentrated to assist reproduction by a more highly sylvicultural system of felling affecting the entire *peuplement :* we must therefore remain dependent for reproduction mainly on fire-protection. If this system has to be adhered to, the information regarding the growing stock cannot be too accurate, in order to fix the number of trees that may be taken out annually, and to show how many trees of the lower class there are to take the place of the mature trees removed; for it is desirable that every fire-protected forest shall be utilized to the full measure of its capabilities without hazarding its being overworked.

It is hoped that, in addition to a permanent demand for sleepers and forest-sawn scantling, a sufficiently large fuel market will be created in consequence of railway extension and the development of other industries. The Conservator of Forests has treated this question in a very able paper, and there seems every reason to believe that his expectations will be realized, more especially if the forest is connected with the railway system and the navigable portions of the rivers by means of tramways. Under such circumstances, it would at once become feasible to concentrate our works, and to make our fellings entirely subordinate to the measures required for the most effective and rapid reproduction. Such concentration of works and fellings would be highly desirable also on account of fire-protection, as has already been pointed out; and it is also important that the fellings should be concentrated in limited areas, as they can then be more effectually supervised than under the present system, under which the selection of trees to be felled has to be left to subordinates to an extent hardly compatible with the highest interests of the forests. If the entire produce of the forest can be utilized, and if we are able to centralize our fellings, it may be possible to formulate a Working-Plan entirely on the basis of area; or, if the conditions of the market demand it, on a rotation of areas, the extent of which is modified by the stock of mature trees on the ground. In the first case, an approximate valuation would meet all requirements; but I feel convinced that the extreme irregularity of the Kheri sál forest, which has been noticed in former paragraphs, will force us to adopt the latter method; for we must not glut a new market in one year, and starve it the next. This plan requires a somewhat more accurate valuation of the growing stock, but I personally think that extensive linear surveys will suffice.

45. If the general scheme has been selected, it remains to be decided what shall be the process by which the forest operations shall be guided in order to ensure the most favourable reproduction, a constant improvement of the soil, and the permanently highest yield of the forest—all of which are conditions which entirely depend on each other, for every improvement of the soil must beneficially influence the permanent highest yield; and a Plan based on the desire to realize in perpetuity the greatest possible outturn must, in the first instance, consider the improvement of the soil, which again can only be secured by its constant activity under a continuous cover of arbori-vegetation. This is the only means of maintaining, to use a farmer's expression, nature in an unturned soil.

In the same way as reproduction and improvement must always form the basis of conservative working, so must all other dispositions of the Working-Plan be subordinate to this; and we must, in the first instance, provide for the certainty of reproduction, the possibility of the maintenance of the young growth, and the preservation of the productive power of the forest.

As regards the certainty of reproduction, we have in a friable and soft soil, such as we find throughout Kheri, mainly to counteract the influence of a dense grass crop, which, as already shown, to a certain extent prevents the seed from germinating within reach of the soil. A certain amount of light overhead is also

necessary, but in a forest free of grass germination takes place under a comparatively dense canopy, though it is infinitely more generous when light has been freely admitted.

In order to provide for the maintenance of the seedlings, exclusion of fire and grazing is a *sine quâ non*, and next in importance is a considerable opening out of the canopy overhead. The importance of this is clearly shown from numerous observations, and is confirmed by the advance growth in the compartments near Dudua and in the Nishangara block in Bahraich.

In order to preserve the productive power, or rather to increase it, it is necessary to maintain or create a leafy canopy at different heights from the ground, as it helps to exclude the drying influence of hot winds and the sun, and so maintains the soil fresh and active. The exclusion of fires is in this connection equally demanded. That this aim can be attained by a system of *Jardinage* is shown by the results of the severe, though formerly unscientific, working of the Bahraich Forest; but I doubt whether the growth of grass in that locality was ever as luxuriant as it is found in the Kheri sál forest, and personally I would prefer to see the introduction of strip fellings.

46. The following is a short sketch of my proposal: Measurements of growing sál trees, the details of which will be dealt with by the Working-Plan, seem to prove that the assumption on which former Plans were based may be maintained—*viz.*, that every 2nd class tree would, under suitable conditions, grow in 40 years into a tree of the 1st class. I accept this to illustrate my plan; but the assumption is, of course, open to correction based on a more detailed sifting of the facts available. I append for reference a table (Appendix C) of measurements of sál trees supplied to me by the Conservator of Forests. If the 2nd class trees of the lowest dimensions can within 40 years reach the size of 1st class trees, a certain number will begin to reach this class every intervening year. If every one of the 2nd class trees was sound, and if the valuation surveys showed that a sufficient number was in existence to replace the 1st class trees removed, it would be quite tenable to fell each year every 1st class tree over 4,000 acres, which would be equal to a yield of 4,400 sound and 10,600 unsound trees, if, for the sake of explanation, we adopt for the time being the results of the actual enumeration for the whole forest. A large proportion of the 2nd class trees is not, however, sound, and can never grow into timber trees of the 1st class, and these encumber the forest to the detriment of more rapid improvement.

Under these circumstances, I would feel inclined to divide the forest into 20 blocks, with a somewhat equal stock of trees. I would then fell, on parallel strips 150 to 200 feet broad, all 1st class trees and such of the 2nd class as are unsound and malformed beyond recovery, leaving alternate strips of the forest untouched. This will, if we again accept, for argument's sake, the figures obtained by the recent enumerations, give an outturn of 2,200 sound mature trees, 5,300 unsound trees of the 1st class, and probably some 5,000 unsound or crooked trees of the lower classes, and consequently lead to the removal of some six trees per acre. Their felling, conversion, and extraction will for the time being destroy the grass crop, and thereby ensure the germination of the seed, and the forest will be sufficiently opened on the strips operated upon to permit of the maintenance and development of the young growth. The belts of intervening untouched forest will contain a sufficient number of seed-bearers and ensure the maintenance of the freshness and consequent fertility of the soil. The annual outturn will increase year by year in as far as 2nd class trees grow into maturity on the belts which are to be worked at a later period. I propose a rotation of 40 years, during which to cut once over the entire forest, in order to be on the safe side. It may be that facts collected during the next season will enable us to shorten this period, or, possibly future experience will show that the rotation may be shortened and that the areas to be worked can consequently be increased. As a fact, I have used figures in this proposal only to explain my design more clearly. If accepted, it rests with the Working-Plan Officer to work out the details.

I have no doubt that a concentration of the work as proposed, the practicability of which depends, however, on the establishment of a market for inferior wood and fuel, will facilitate fire-protection, ensure a more rapid and complete reproduction, cheapen timber-works, and facilitate supervision.

Miscellaneous Forests and other Forest Lands in the Kheri Division.

47. I am of opinion that no changes should at present be contemplated in the management of the forests and grass tracts outside the valuable sál forest. They are, it is true, burnt every year, and the consequence is that natural reproduction does not replace the trees felled or destroyed; that the ground only produces the coarsest of grasses; and that no permanent improvement of the soil can take place. The soil contains the same amount of mica and other mineral substances which, when decomposed, form the fertile loamy sand of the "damar"; but such decomposition is checked under the influence of constantly recurring fires, which destroy the vegetable mould so necessary to reduce the mineral components of the soil; and though the ashes of the burnt grass are fit for immediate assimilation, they do not assist in the decomposition of the mineral reserves of the soil and consequently do not effect its permanent improvement. Nevertheless, I do not advocate, at least for the present, any interference beyond the strict protection of all sál-producing tracts, for the other forests are not as yet sufficiently valuable and necessary to the State to be worth the unpopularity which would arise from an abrupt interference with an established custom, however objectionable it may be in the abstract, further than is absolutely necessary.

Under such circumstances, the only protection we can afford to the forest lands of the less valuable classes is to burn them as early in the season as possible, when the grass in the areas as yet covered with trees has still remained sufficiently green to arrest the course of the fire. Such plots become thereby isolated, and may escape if not wilfully fired.

VI.—Bhira Forest.

48. The high-lying alluvium to the west of the Sarda, which, immediately below the hills, where it occupies a broad stretch of country traversed by numerous small streams and nalas, is known as the Kumaun Tarai, narrows into a belt of less than 8 miles in breadth between the Deoha nala and the Sarda river. This narrow stretch of high ground sub-divides north of Maina Kot into two more or less deeply serrated branches, which gradually disappear in the low-lying country. The southern extremity of the eastern branch is occupied by the Bhira Forest.

The layer of decomposed soil is throughout this forest of less depth and of poorer quality than in either Bahraich or Kheri, and this is more especially the case where the high ground gradually disappears in the low-lying country. This same inferiority of the soil towards the last slopes of the high ground has already been observed with regard to the Bahraich Forest, south of Motipur.

The Bhira Forest is almost pure sál, but of a very inferior growth and character, if compared even with the worst parts of Kheri and Bahraich, though the forest growth improves somewhat towards the north, where the soil becomes both deeper and better; towards the south it shades off into dhâk-producing jungles.

49. More than half of the area is occupied by large phántas covered with a low bushy scrub jungle of sál, which dies down year by year, being killed by either frost or fire, or both, in one season. I have not been able to trace the origin of these phántas, nor the reason of their existence, entirely to my own satisfaction, though I formed a theory on the observations I made on the spot—that the present growth is not due to natural causes, but represents the remnants of an artificially destroyed forest of an entirely different character. There is no appreciable difference in the level of the country which would cause a collection of water sufficient to interfere with the growth of sál trees, nor would a collection of water, though it might certainly prevent the growth of sál, ever produce the singular appearance in the trees which is observed in the Bhira phántas, nor have I been able to discern any difference in the soil sufficiently pronounced to account for the peculiar character of the forest, though I had holes dug within these phántas and within the forest in the immediate vicinity. The lower root system of this stunted sál scrub is frequently sound and normally developed, sometimes with one, sometimes with a divided, taproot.

About 12 inches from the surface, however, the healthy development disappears in a gnarled, twisted, and knotty mass of fibre, looking like a huge piece of ginger; and these excrescences send forth year after year a fresh crop of coppice-shoots, appearing sufficiently vigorous to the casual observer to warrant the expectation of the establishment of a fully stocked coppice forest. On closer examination, however, it is found that these shoots are only connected with the root system in an extremely imperfect manner; and that as the shoots grow and increase, no expansion of the connecting ducts can take place because of the masses of gnarled fibre which encircle them. The coppice-shoots look as if they were stuck on to the knotty ginger-like surface root in the same way as the branches on to a pollard willow, only much less securely, so that the slightest wrench separates them, exposing a wavy, short-fibred surface, like a rope which has been twisted the wrong way round.

The young shoots are, as a rule, killed by fires and frost before they are 12 months old, enlarging year by year the excrescence from which they spring, and which is formed by the dead lower portions of such shoots, surrounded by masses of undeveloped lignified buds. The normally developed roots are too far below the surface to permit of a direct coppice; and even if the coppice-shoots, sprung from the diseased surface portion, escaped fires and frost year after year, there is but a small chance that a direct connection would ever be established between them and the healthy root system—a condition which entirely destroys any hope of a more favourable future development of the existing forest growth by the amelioration of the soil. In my opinion, no amount of protection will overcome the evil, though it might *perhaps* be possible to obtain a direct coppice from the roots, by removing the conglomeration of twisted fibre, which at present prevents them from developing original buds. I am of opinion that the lower (sometimes fairly developed) roots could not have formed as they have done under the present condition, and this makes me think that a sál forest of a different character once occupied these phántas, and that the forest was cut down on these areas and grubbed out just sufficiently deep to admit of the cultivation of the soil, and that this cultivation was of a very temporary character only, at least not of sufficient duration and not severe enough to destroy the vitality of the sál roots. These latter coppiced, but the shoots were again and again destroyed, and the present formation is the consequence.

50. The poor appearance of the forest, apart from these phántas, is to some extent probably due to the character of the soil, but even more to former treatment, and to the still constantly recurring forest fires, which not only affect the forest itself, but prevent any amelioration of the soil and other conditions necessary for a more vigorous growth. Strict fire-protection over as large an area as feasible is, therefore, highly desirable; but I doubt whether the forest growth now on the ground has not already suffered too intensely to be able to recover to the degree desirable, and I therefore consider that it would be advisable to replace it by a more vigorous young growth. Strip-fellings in the fire-protected area, which were made 3 years ago near the central forest-house, have yielded sufficiently favourable results to commend a similar treatment for all fire-protected areas. It is doubtless desirable that a Working-Plan should be framed for this forest; but such a Plan may be extremely simple, and, as it will, of course, be based entirely on sylvicultural requirements and area, a very superficial valuation of the growing stock will suffice. The restocking of the phántas will prove a process of considerable difficulty, for mere protection will not, I feel certain, suffice, as there are neither seed-bearing trees nor sound stocks. The grubbing out of the ginger-like excrescences may be tried, but the result is problematical. Artificial reproduction on a large scale will be expensive, and we have, moreover, as yet but little experience in the artificial cultivation of sál. It is essential that experiments should be made in this direction, for it may be found that ploughing and sowing will yield sufficiently favourable results; or some other cheap, and at the same time efficient, way of cultivation may be discovered.

VII.—Puranpur Forest.

51. This forest is a continuation of the Bhira Forest towards the north-west.

The surface-soil, which, as already stated, improves towards the hills, is both deeper and better than in the last described forest; but the tree growth is almost worse, though I observed several stumps of considerable size, which bear evidence that once on a time a forest existed of a very different character from that which now covers the ground. The present state of the forest is, therefore, entirely due to abuse. Ever since 1850 the villagers of the pargana in which the forest is situated have been permitted, under an order of the Commissioner of Rohilkhand, to use this forest almost unrestrictedly. It is fired to produce new grass, small saplings are cut for fencing, and larger poles for rafters; and seeing the indiscriminate way in which the reproduction is cut down, and the wasteful manner in which the material is used, the wonder is not that the forest is so extremely poor, but that it is still in existence at all. I have seen fences consisting of sál saplings a year or two old stuck upright into the ground a foot or 18 inches apart; and certainly a more wasteful manner of making a fence could not be imagined. The recent Settlement has so far improved matters, in that it entirely closes the Maina Kot and Dhanaura blocks, comprising about one-third of the forest, as Government property free of rights. This portion is saved, but the condition of the rest—the so-called "open forest"—is only slightly ameliorated, as long as Rule VII of the Puranpur Forest Rules, which is probably unique and evidently escaped observation, is not cancelled.

It would be advisable to fire-protect the Maina Kot and Dhanaura blocks belonging entirely to Government, and it would be desirable if a simple Plan were prepared for their working and treatment. A feasible Plan for the working of the open forest can, under existing circumstances, hardly be framed; and it may be doubtful whether it would be financially excusable to throw the cost of the management and of the necessary fire-protection of the forest on the State, when, as far as can be foreseen, the entire produce will be reaped by the inhabitants of one pargana. I look upon these forests as lost to the State, though perhaps it might be possible to free a part of them from the rights with which they are burdened by sacrificing the proprietary rights in the rest.

VIII.—Pilibhit Forest.

52. This forest is divided from the Puranpur Forest by the Mala swamp, which cuts through the high-lying alluvium.

The soil is very similar to that in the northern part of the Puranpur Forest; but the forest has received a more lenient treatment, and the villagers have to pay for the produce used by them, and the forest is consequently much superior in every respect. A considerable portion of the Pilibhit Forest, amounting to 7,852 acres, has been fire-traced for years. In some of the fire-traced compartments strip-fellings were made in 1883-84 and the three subsequent years. The result of these operations is an unqualified success, and the strips of 1883-84 are now covered with an almost complete thicket, varying in height from 6 to 16 feet. The rights granted in this forest do not materially interfere with its management; and as the last three years' experience has shown that reproduction can be readily ensured, the preparation of a Working-Plan should present no difficulties, and be the work of a few weeks only; for I do not think that an elaborate enumeration is either feasible or necessary.

APPENDIX A.

List of areas of Private Forests in Pargana Puranpur, with the names of the Villages to which they belong.

No.	Name of Village.	Area.		Remarks. The numbers quoted in this column are from Schedule A—List of Villages.
		Bighas.	Biswas.	
1	Amritpur	20	6	
2	Itauria	716	...	See No. 235.
3	*Amritpur in Ghangchaie*	248	16	
4	Urajhar	136	18	
5	Abhepur Madhopur	522	14	
6	Abhepur Imilia	385	11	
7	Akbarpur	124	18	
8	Bidhipur	194	13	
9	Bhaipur	229	2	
10	Banjaria	173	2	
11	*Burwa Kothara*	41	10	
12	*Bunder Bojee*	960	13	
13	*Boondee Binaur*	1,274	12	See Nos. 133 and 246.
14	Baijunagar	135	11	
15	Bakainia	12	19	
16	Binaur	623	19	
17	Balkarnpur	528	10	
18	Baktapur	172	7	
19	*Bhuda*	573	17	
20	Bangla	98	19	
21	Piparia Dodai	327	7	
22	Pata Bhoji	57	6	
23	Pachpera Garha	96	18	
24	Parasrampur	30	13	
25	Pachpera	47	17	
26	Piparia Karu	378	11	
27	Purania Dipnagar	1,169	5	
28		94	10	
29	Jatpura	39	15	
30	Jamania	940	3	See No. 250.
31	Jairampur	39	6	
32	Jarra	81	8	See No. 226.
33	Jarri	281	4	
34	Chandua	822	19	
35	Chaut Firozpur	97	3	
36	*Chundia*	9,581	12	
37	*Chakatpur of Anundpore*	223	13	
38	*Khanpur*	1,063	...	
39	*Doonda*	1,107	14	
40	*Dandaul*	1,618	16	
41	Dumgadhi	129	18	
42	*Daleebpur Itolia*	35	15	
43	Dhokia	813	3	See No. 50.
44	Raipur	342	5	See No. 207.
45	*Rasulpur*	21	2	No. 108.
46	Rudpur	61	1	
47	Rampur	582	18	See No. 208.
48	*Sunhan*	1,149	8	
49	Sirsa	143	17	
50	Suabojh	14	8	
51	*Singsara*	5,100	16	
52	*Suntnagar*	59	11	
53	Santokhpur	303	5	
54	Shahgarh	372	16	
55	Abdullapur	25	10	
56	*Gareebpur*	510	6	
57	Kalungara	154	15	
58	Kiratpur Janipur	519	4	See No. 16.
59	Kesarpur	309	1	See No. 11.
	Carried over ...	35,922	16	

List of areas of Private Forests in Pargana Puranpur, with the names of the Villages to which they belong—contd.

No.	Name of Village.	Area. Bighas.	Area. Biswas.	Remarks. The numbers quoted in this column are from Schedule A—List of Villages.
	Brought over ...	35,922	16	
60		658	4	
61	Kalianpur	44	...	
62	Kiratpur	280	3	See No. 75.
63	*Kabeerganj*	2,882	7	
64	Kesarpur	961	18	
65	Kunwarpur Gajranla	117	3	
66	Gajranla	159	2	See No. 4.
67	Gajranla Kalan	182	4	
68	Gajranla Zabti	41	9	
69	Gajranla Khurd	61	3	
70	Gularia	167	4	See No. 206.
71	Gadiana	167	4	
72	Gabtinya	22	4	
73	*Gopalpur*	1,352	12	
74	*Ghatumpur*	42	18	
75	*Ladpur*	325	3	Nos. 92 or 232.
76		1,892	...	
77	*Laga Bhaga*	777	6	
78	*Maharajpur*	699	...	
79	Muradpur	424	8	
80	*Mutian Ghanchaie*	2,560	....	No. 247.
81	Malin Kuniyan	176	14	
82	*Mahugalarya*	5	14	
83	*Manpur Tilher*	182	4	No. 222.
84	*Manpur Madhotanda*	33	18	
85	*Mutia Lalpur*	18	19	
86	Mathua Zabti	803	3	
87	Manharia Kalan Khurd	84	15	
88	*Mulpur*	72	6	No. 255.
89	Mustafabad	117	15	
90	Mainakot	3,025	...	
91	Nawadia	99	16	
92	Nawadia Sabalpur	...	16	
93	*Nawadia near Tanda*	528	16	Nos. 35 and 230.
94	...	3,398	6	
95	Neoria	98	5	
96	Haripur	283	...	No. 2.
97	Haripur	182	9	No. 177.
98	Hurgaon	282	8	
99	*Grant No. 21*	6,703	7	
100	*Grant No. 2*	597	17	
101	Grant No. 1 Barnesganj	5,354	9	
102	A portion of forest	531	7	
	Total ...	72,321	12	= 45,201 acres.
	An acre = 1⅗ bigha.			

The names of Villages in italics denote that they are not mentioned in Schedule A—List of Villages in Puranpur.

APPENDIX B.

Table showing the number of Trees felled in the Kheri Sál Forests and the places where the fellings took place, referring, wherever possible, to the numbers of Compartments made out by Dr. Schlich.

Year.	Number of Trees felled.	Description of Fellings.	Place of Felling.	Reference to Dr. Schlich's map.
1861-62 ...	2,308	Miscellaneous ...	Mujli Forest	1 and 2
1862-63	840	Selection ...	Forest tract No. 32 in Forest Map, Gwarighat Forest.	1
	768	Sleepers ...		
	1,160	Selection ...	Newal Khar, No. 36 tract.	
	322	Ditto ...	Ramgarh Forest, No. 31 tract.	
	840	Ditto ...	Chandpur Forest, No. 37 tract.	
1864-65 ...	2,966	Ditto ...	No. 32 tract, in extreme north-west ...	1
1865-66	563	Ditto ...	Belghat.	
	1,310	Ditto ...	Newal Khar.	
	1,010	Ditto ...	Phulwaria.	
	688	Ditto ...	Bankatti.	
	434	Ditto ...	Mujli.	
	601	Ditto ...	Panlaba.	
	231	Ditto ...	Gwali Gauri.	
	222	Ditto ...	Bagania Tal.	
	313	Ditto ...	Kiratpur.	
1866-67 ...	650	Purchasers ...	North portion of Salukapur, east of Dudua-Musan Khamb line	
1868-69 ...	1,150	Selection ...	At the second Suheli line, and proceeded northwards to the west of the main line.	
1869-70 ...	2,942	Ditto ...	Went on where left off on previous year—*viz.*, in Block 5 of Report Map, and continued in Block 4.	
1870-71 ...	1,819	Ditto ...	In Block 3 of Section 2.	
1871-72 ...	2,423	Ditto ...	In Block 3, then on in Block 2.	
1872-73 ...	2,631.	Ditto ...	Probably in Block 2.	
1873-74 ...	3,000	Ditto ...		
1874-75 ...	2,900	Ditto ...	Commenced in Block 13, crossed Block 7, and entered Block 6.	
1875-76 ...	3,000	Ditto ...	Where last year's work left off, crossed into Block 6 of Revenue Survey Map, and ended in Block 16.	
1876-77	3,020	Sál } Selection fellings.	Blocks 2 and 3 north-east of Dudua-Chandpura Road.	
	453	Asseina } Selection fellings.		
	2,247	Patna contract ...	Khairigarh Sub-division, Block 4, Bhadauri, east of Fort Karia Road.	
1877-78	4,164	S. } Selection fellings and Patna contract.	Khairigarh Sub-division, Forest Block between Bhadi Tal and Bilrain Deh.	
	1,015	A. } Selection fellings and Patna contract.		
Carried over	45,990	...	.....	

Table showing the number of Trees felled in the Kheri Sal Forests and the places where the fellings took place, referring, wherever possible, to the numbers of Compartments made out by Dr. Schlich—concld.

Year.	Number of Trees felled.	Description of Fellings.	Place of Felling.	Reference to Dr. Schlich's map.
Brought forward	45,990			
1878-79	2,750	S. Selection fellings.	In Forest blocks between Dudua and Chandpura.	
	578	A. Selection fellings.	Chandpura-Sathiana, Sathiana-Dudua, and No. 1 Suheli line.	
1879-80 ...	1,973	S. Selection ...	Block west of Sathiana line and south of No. 1 Suheli line.	
1880-81 ...	2,006	S. Ditto ...	Block south of Masan Khamb and north and north-east of Dudua—*i.e.*, bounded by Dudua-Masan Khamb and Dudua-Chandan chauki lines and forest south of Badraula.	
1881-82	2,528	S. Selection fellings.	Between Dudua-Masan Khamb and Jamnahia-Badraula lines.	
	531	A. Selection fellings.		
1882-83	2,500	S. Selection ...	.....	
	8,712	S. Sleepers ...	.....	
	783	S. Removed by purchasers.	.....	
	628	A. Removed by purchasers.		
1883-84	2,537	S. Selection ...	.....	
	30,480	S. Sleeper fellings.	.....	
	4,259	A. Sleeper fellings.	.....	
	453	S. Removed by purchasers.	.....	
	826	A. Removed by purchasers.	.....	
1884-85	2,551	S. Selection fellings.	.....	
	431	A. Selection fellings.	.....	
	6,739	S. Sleeper fellings.	.....	
	822	A. Sleeper fellings.		
	403	S. Removed by purchasers.	.....	
	2	A. Removed by purchasers.		
1885-86	2,500	S. Selection ...	51, 56, near Mujli Tal ...	☞
	10,760	S. Sleeper fellings.	48, 50, 55, 49, 53, 61, 62, 63 ...	☞
	9,081	A. Sleeper fellings.	22, 23, 24, 29, 33*a*, 34, 35, 45, 46 ...	☞
	90	Signal posts ...	29 and 33*a*.	
	100	Scantlings ...	.....	
Total ...	1,41,013			
1876-77 ...	5,022	S. Removed by purchasers.	This amount not being certain is added at the end.	
Grand Total...	1,46,035			

APPENDIX C.

Measurements of Sal and other Trees in the Kheri Division.

DARYIA.

KHERI DIVISION, OUDH CIRCLE, No. 1, ¼ ACRE PLOT.

Measurements to ascertain the growth of Sâl and Asseina.

Name of the ¼ acre plot and exact situation in the Forest Block.	Number.	Description of Trees.	Measurements of girth at 5 feet from the ground.															Difference between 1880—1888.	Remarks.
			May 1880.	December 1880.	February 1881.	June 1881.	December 1881.	March 1882.	June 1882.	December 1882.	March 1883.	June 1883.	December 1883.	March 1884.	June 1884.	March 1885.	March 1888.		
No. 1. Situated on the 10-foot fire conservancy line from Dudua to Daryia and about ¾ mile from Dudua.	1	Sâl ...	1·3¾	1·4⅛	1·4⅜	1·4¾	1·4⅞	1·5⅛	1·5⅛	1·5	1·5⅛	1·5⅛	1·5⅛	1·5¼	1·5⅛	1·6¼	1·6	2·500	Bark eaten by white ants.
	2	,, ...	1·2¾	1·2¾	1·2⅞	1·2¾	1·3	1·3¼	1·3⅛	1·3	1·3⅜	1·3½	1·3⅜	1·3¼	1·3½	1·4½	1·4⅜	1·750	Bark fallen.
	3	,, ...	2·4	2·5¼	2·5⅜	2·5¾	2·6⅞	2·7	2·7⅛	2·7½	2·7⅞	2·7¾	2·8¼	2·8⅜	2·8½	2·8¾	2·9⅝	5·500	
	4	,, ...	1·1¾	1·2⅛	1·2¼	1·2⅛	1·2⅜	1·2⅜	1·2½	1·2⅜	1·2⅜	1·2⅜	1·2⅜	1·2⅜	1·2½	1·2½	1·2⅜	·625	Bark eaten by white ants.
	5	,, ...	1·6¼	1·8	1·8⅛	1·8⅞	1·9¼	1·9⅜	1·9⅝	1·10⅜	1·10⅝	1·10¾	1·10⅝	1·10⅞	1·11	1·11⅜	1·11⅞	4·875	Ditto ditto
	6	,, ...	2·0¼	2·1⅛	2·1⅛	2·1⅛	2·2	2·2¾	2·2¾	2·2¼	2·3⅜	2·3¾	2·3¼	2·3⅜	2·3⅜	2·4⅛	2·4⅜	4·0	
	7	,, ...	1·5⅜	1·6	1·6⅛	1·6⅛	1·6⅜	1·7	1·7	1·7⅛	1·7⅜	1·7⅛	1·8⅛	1·8⅜	1·8⅛	1·8⅜	1·9	3·625	Bark eaten by white ants.
	8	,, ...	1·3⅜	1·2⅞	1·2⅞	1·2⅞	1·3¾	1·3¾	1·3¾	1·3⅞	1·3⅜	1·3⅜	1·4⅛	1·4⅛	1·4⅜	1·4⅛	1·4½	2·500	Ditto ditto
	9	,, ...	2·7⅛	2·9⅛	2·9⅛	2·9⅛	2·10⅜	2·11⅛	2·11⅛	2·11⅛	2·11⅞	2·11⅛	3·0	3·0	3·0⅛	3·1	3·1⅜	5·500	Bark fallen.
	10	,, ...	1·3¼	1·4⅛	1·4⅛	1·4¼	1·4¼	1·5	1·5⅛	1·5⅛	1·5⅜	1·5⅜	1·5⅝	1·5⅞	1·6⅜	1·6⅜	1·6⅛	3·125	Bark eaten by white ants.
	11	,, ...	1·4⅛	1·5⅛	1·5⅜	1·5⅜	1·6¼	1·6⅜	1·6⅜	1·7	1·6⅜	1·6⅜	1·7⅜	1·7⅜	1·7⅛	1·7⅜	1·9⅛	3·750	Bark fallen.
	12	,, ...	4·2⅜	4·2⅞	4·3⅛	4·3⅛	4·4¼	4·4⅜	4·4⅞	4·5⅛	4·4⅜	4·4⅜	4·5⅜	4·5⅜	4·5⅛	4·6	4·5⅜	3·500	Ditto
	13	,, ...	1·3	1·3⅜	1·3⅜	1·3⅛	1·4	1·4	1·4⅛	1·4¼	1·4⅜	1·4⅜	1·4⅞	1·4⅞	1·4⅞	1·5⅜	1·5⅜	2·500	Ditto
	14	,, ...	1·10⅞	2·0	2·0	2·0⅛	2·0⅜	2·1	2·1	2·2	2·2⅛	2·2⅜	2·3	2·3	2·3⅜	2·3⅜	2·4⅜	5·500	Ditto
	15	,, ...	1·1⅜	1·2⅜	1·2⅜	1·2⅞	1·3⅜	1·4	1·4	1·4⅜	1·4⅜	1·4⅜	1·4⅞	1·4⅞	1·5⅛	1·5⅛	1·5⅜	4·0	Ditto
	16	,, ...	1·3⅛	1·3⅜	1·3⅜	1·3⅜	1·5⅛	1·5⅜	1·5⅜	1·5⅜	1·5⅜	1·5⅜	1·5⅜	1·5⅜	1·5⅜	1·6	1·6⅜	3·250	Ditto
	17	,, ...	1·2⅜	1·2⅜	1·3⅜	1·3⅛	1·4⅛	1·4⅜	1·4⅜	1·5⅜	1·5⅜	1·5⅜	1·6⅛	1·6⅛	1·6⅛	1·7⅜	1·8⅜	6·125	
	18	,, ...	1·6⅛	1·7⅜	1·7⅜	1·7⅜	1·8⅜	1·9⅜	1·9⅜	1·10⅜	1·10⅜	1·10	1·11⅛	1·11⅛	1·11⅜	2·0⅜	2·1⅛	7·0	
	19	,, ...	4·10⅜	4·11⅜	4·11⅜	4·11⅜	5·0⅜	5·0⅜	5·0⅛	5·1	5·1⅜	5·1⅜	5·1⅜	5·1⅜	5·1⅜	5·2⅜	5·2	3·250	Bark fallen.
	20	,, ...	5·6⅜	5·8⅜	5·8⅜	5·8⅜	5·9⅜	5·9⅞	5·10	5·10⅜	5·11⅛	5·11⅛	5·11⅞	5·11⅜	5·11⅜	6·0⅜	6·0⅜	5·750	Ditto
	21	,, ...	4·7⅜	4·8⅜	4·8⅜	4·8⅜	4·8⅜	4·8⅜	4·9⅛	4·9⅛	4·9⅛	4·8⅜	4·9	4·8⅜	4·8⅞	4·9	4·9⅜	1·500	Ditto
	22	,, ...	1·7⅜	1·8⅜	1·8⅜	1·8⅜	1·8⅜	1·9⅛	1·9⅛	1·9⅜	1·10⅜	1·10⅜	1·9⅜	1·9⅜	1·10⅜	1·10⅜	1·10⅜	3·125	Bark eaten by white ants.
	23	,, ...	1·3	1·4⅜	1·4⅜	1·4⅜	1·5⅜	1·5⅜	1·5⅛	1·5⅜	1·5⅛	1·5⅜	1·5⅛	1·5⅜	1·5⅜	1·5⅛	1·5⅜	2·500	Ditto ditto
Total ...			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	85·750	
Average per tree per annum.			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	·533	

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A

SAROTA PHATA.

KHERI DIVISION, OUDH CIRCLE No. 2, ¼ ACRE PLOT.

Measurements to ascertain the growth of Sal and Asseina.

Name of ¼ acre plot.	Number.	Description of Trees.	Measurements of girth at 5 feet from the ground. 10th May 1880.	December 1880.	February 1881.	June 1881.	December 1881.	March 1882.	June 1882.	December 1882.	March 1883.	June 1883.	December 1883.	March 1884.	June 1884.	March 1885.	March 1886.	Difference.	Remarks.
No. 2. Situated on the 10-foot fire conservancy line to Sarota Phata and about 20 yards from Dudua.	1	Sál ...	4·7 1/8	4·8 1/8	4·8 1/8	4·8 1/8	4·9 3/8	4·9 3/8	4·10	4·10 1/8	4·10 7/8	4·10 5/8	5·0	4·11 1/8	4·11 5/8	5·2	5·3	7·750	
	2	,, ...	2·8 1/8	2·10 1/8	2·11	2·11 1/8	3·1 1/8	3·1 1/8	3·2	3·2 1/8	3·2 1/8	3·1 7/8	3·4	3·4	3·3 3/8	3·5 1/8	3·6 1/8	9·625	
	3	,, ...	2·9 1/8	2·11	2·11 1/8	2·11 1/8	3·1 3/8	3·1 3/8	3·1 5/8	3·2 1/8	3·1 5/8	3·1 5/8	3·3 7/8	3·3 7/8	3·3 3/8	3·4 3/8	3·5 1/8	6·250	
	4	,, ...	1·10 7/8	1·11 3/8	1·11 3/8	1·11 3/8	2·0	2·0 1/8	2·0 1/8	2·0 3/8	2·1 3/8	2·1 3/8	2·1 7/8	2·1 7/8	2·2 1/8	2·2 3/8	2·3 3/8	4·625	Bark fallen.
	5	,, ...	1·7 1/8	1·8 3/8	1·8 3/8	1·8 3/8	1·9 3/8	1·9 1/8	1·9 1/8	1·10	1·10 1/8	1·9 7/8	1·10 3/8	1·10 3/8	1·10 3/8	2·0	2·0 1/8	5·500	
	6	,, ...	1·7 3/8	1·8	1·8	1·8	1·8 1/8	1·8 3/8	1·8 3/8	1·8 1/8	1·9 1/8	1·9 3/8	1·8 3/8	1·8 3/8	1·9 1/8	1·9 1/8	1·10	2·750	Bark fallen.
	7	,, ...	1·6 3/8	1·6 1/8	1·6 1/8	1·6 1/8	1·6 1/8	1·6 3/8	1·6 3/8	1·6 3/8	1·6 1/8	1·7 1/8	1·7 1/8	1·7 1/8	1·7 3/8	1·7 3/8	1·7 7/8	1·0	
	8	,, ...	1·1 7/8	1·2 1/8	1·2 1/8	1·2 1/8	1·2 1/8	1·2 1/8	1·2 1/8	1·2 1/8	1·2 7/8	1·2 3/8	1·3 1/8	1·3 1/8	1·3 1/8	1·4	1·4 1/8	2·500	
	9	,, ...	1·4 7/8	1·5 1/8	1·5 1/8	1·5 1/8	1·6 1/8	1·6 1/8	1·6 1/8	1·6	1·6 1/8	1·5 5/8	1·6 1/8	1·6 1/8	1·6 1/8	1·6 3/8	1·6 3/8	1·375	Bark fallen.
	10	,, ...	7·0 3/8	7·1 1/8	7·1 1/8	7·1 1/8	7·1 3/8	7·1 3/8	7·1 1/2	7·2	7·2 1/8	7·1 7/8	7·2 1/8	7·2 1/8	7·2 1/8	7·2 1/8	7·2 1/8	1·750	Bark fallen.
	11	,, ...	1·6	1·6 1/8	1·6 1/8	1·6 3/8	1·8 1/8	1·8 1/8	1·8 3/8	1·8 3/8	1·8 1/8	1·8 1/8	1·9 1/8	1·9 1/8	1·9 1/8	1·11	1·11 1/8	5·750	Knot has come out where measured.
	12	,, ...	1·2 1/8	1·2 1/8	1·2 1/8	1·2 1/8	1·2 1/8	1·2 3/8	1·3	1·3 1/8	1·3 1/8	1·3	1·3 1/8	1·3 1/8	1·3 1/8	1·3 1/8	1·3 3/8	1·625	Bark eaten by white ants.
	13	,, ...	1·1 3/8	1·2 1/8	1·2 1/8	1·2 1/8	1·2 3/8	1·3 1/8	1·3 1/8	1·3 3/8	1·3 1/8	1·3 1/8	1·4 1/8	1·4 1/8	1·4 1/8	1·4 3/8	1·5 1/8	4·0	
	14	,, ...	1·1 1/8	1·2 1/8	1·2 1/8	1·2 1/8	1·3 1/8	1·3 3/8	1·3 7/8	1·4 1/8	1·4 1/8	1·4 3/8	1·5 3/8	1·5 1/8	1·5 1/8	1·6 1/8	1·6 1/8	5·125	Bark fallen.
	15	,, ...	1·4 1/8	1·5	1·5	1·5	1·5 7/8	1·6 1/8	1·6 1/8	1·6 1/8	1·6 3/8	1·6 3/8	1·7 1/8	1·7 1/8	1·7 7/8	1·7 3/8	1·8 1/8	4·250	
	16	,, ...	1·8 1/8	1·9	1·9 1/8	1·9 1/8	1·10	1·10	1·10	1·11	1·11	1·10 3/8	1·11 1/8	1·11 1/8	1·11 1/8	2·0 1/8	2·0 1/8	4·250	Bark fallen.
	17	,, ...	1·3 1/8	1·5	1·4 1/8	1·4 3/8	1·5 1/8	1·5 1/8	1·5 1/8	1·6	1·6 1/8	1·6	1·6 1/8	1·6 1/8	1·6 1/8	1·7 1/8	1·8	4·125	Bark eaten by white ants.
	18	,, ...	1·1 1/8	1·2 1/8	1·2 1/8	1·2 3/8	1·4	1·4 1/8	1·4 1/8	1·5	1·5	1·4 1/8	1·6	1·6	1·5 1/8	1·6 3/8	1·7 1/8	5·625	
	19	,, ...	2·2 1/8	2·3 3/8	2·3 1/8	2·3 1/8	2·4	2·4 3/8	2·4 1/8	2·5	2·6	2·5 7/8	2·6 1/8	2·6 1/8	2·6 3/8	2·6 3/8	2·7 1/8	4·750	
Total ...			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	84·625	
Average per tree per annum.			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	·636	

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SONARIPUR.

KHERI DIVISION, OUDH CIRCLE, No. 3, ¼ ACRE PLOT.

Measurements to ascertain the growth of Sal and Asseina.

Name of ¼ acre plot.	Number.	Description of Trees.	Measurements of girth at 5 feet from the ground.															Difference.	Remarks.
			10th May 1880.	1st to 12th December 1880.	February 1881.	4th June 1881.	10th December 1881.	13th March 1882.	6th June 1882.	December 1882.	March 1883.	June 1883.	December 1883.	March 1884.	June 1884.	March 1885.	March 1886.		
No. 3. Situated on the 10-foot fire conservancy line to Sonaripur, and about ½ mile from Dudua.	1	Sal ...	1·8¼	1·9¼	1·9¼	1·9¼	1·10⅛	1·10⅛	1·10⅛	1·11⅜	1·11⅜	1·11⅜	2·0⅜	2·0⅜	2·0⅜	2·1⅛	2·1⅛	5·375	
	2	,, ...	1·3¼	1·4¼	1·4¼	1·4¼	1·5	1·5¼	1·5¼	1·5¼	1·6	1·6	1·6⅛	1·6⅛	1·6⅛	1·7⅛	1·7⅛	3·500	Bark eaten by white ants.
	3	,, ...	1·6¼	1·6⅛	1·8⅛	1·8⅛	1·8⅜	1·9	1·9	1·9⅛	1·10⅜	1·10⅜	1·10⅜	1·10⅜	1·11⅜	1·11⅜	2·0⅛	5·750	Ditto ditto.
	4	,, ...	3·0⅜	3·2	3·2⅛	3·2⅛	3·4⅜	3·4⅛	3·4⅛	3·5⅜	3·5⅛	3·4⅜	3·7⅜	3·7	3·6⅛	3·8⅛	3·9⅜	9·0	
	5	,, ...	1·1	1·1⅜	1·1⅜	1·1⅜	1·1⅜	1·1⅜	1·1⅜	1·1⅜	1·1⅜	1·1⅜	1·2⅛	1·2	1·2⅛	1·2⅛	1·2⅛	1·625	Ditto ditto.
	6	,, ...	1·3⅜	1·4⅜	1·4⅜	1·4⅜	1·5	1·5	1·5⅛	1·5⅜	1·6	1·6	1·6⅛	1·6	1·6⅜	1·6⅜	1·7⅜	3·500	Bark fallen.
	7	,, ...	0·11	0·11⅜	0·11⅜	0·11⅜	0·11⅜	0·11⅛	0·11⅛	0·11⅛	0·11⅜	0·11⅜	1·0	0·11⅜	1·0⅜	1·0⅜	1·0⅜	1·250	Bark eaten by white ants.
	8	,, ...	1·9⅜	1·10⅛	1·10⅛	1·10⅜	1·11⅜	2·0	2·0	2·0⅛	2·0⅛	2·0⅜	2·1⅜	2·2	2·1⅜	2·3⅜	2·3⅛	5·875	Ditto ditto.
	9	,, ...	2·1⅛	2·1⅜	2·1⅜	2·1⅜	2·2⅜	2·2⅛	2·2⅜	2·3⅛	2·3⅜	2·2⅜	2·3⅜	2·3⅜	2·3⅜	2·4⅜	2·4⅜	3·750	
	10	,, ...	1·2⅜	1·2⅛	1·2⅜	1·2⅜	1·3⅛	1·3⅜	1·3⅛	1·3⅛	1·3⅛	1·3⅜	1·4⅜	1·4⅛	1·3⅜	1·4⅜	1·5⅜	3·0	
	11	,, ...	1·1⅜	1·2⅜	1·2⅛	1·2⅜	1·3⅛	1·3⅜	1·3⅜	1·3⅜	1·3⅜	1·3⅛	1·3⅜	1·3⅜	1·3⅜	1·4⅜	1·4⅜	2·750	Ditto ditto.
	12	,, ...	1·1⅛	1·2⅛	1·2⅛	1·2⅜	1·2⅛	1·2⅛	1·2⅛	1·2⅜	1·3⅛	1·3	1·3⅛	1·3⅜	1·3⅛	1·3⅜	1·4⅛	2·625	Ditto ditto.
	13	,, ...	2·0⅛	2·1	2·1	2·1	2·1⅛	2·1⅛	2·1⅛	2·2	2·2⅛	2·2	2·2⅜	2·2⅛	2·2⅜	2·3⅛	2·3⅛	3·125	
	14	,, ...	1·5⅛	1·5⅜	1·5⅜	1·5⅛	1·5⅜	1·5⅛	1·5⅛	1·5⅛	1·5⅜	1·5⅛	1·5⅜	1·5⅛	1·5⅜	1·6	1·6⅛	·875	Bark fallen.
	15	,, ...	2·1	2·1⅜	2·1⅜	2·1⅜	2·1⅜	2·1⅜	2·1⅜	2·1⅜	2·1⅜	2·1⅜	2·2⅜	2·2⅜	2·2⅜	2·2⅛	2·2⅜	1·875	Ditto.
	16	,, ...	1·1⅜	1·1⅛	1·1⅛	1·1⅜	1·2⅜	1·2⅜	1·2⅜	1·2⅛	1·2⅜	1·2⅛	1·2⅜	1·2⅜	1·3⅜	1·3⅜	1·3⅛	2·250	Bark eaten by white ants.
	17	,, ...	3·6⅜	3·7⅜	3·7⅜	3·8	3·9⅛	3·9⅛	3·9⅛	3·9⅜	3·9⅛	3·9⅛	3·10⅛	3·10⅛	3·10⅛	3·11⅛	4·0	5·125	
	18	,, ...	3·6⅛	3·7⅜	3·7⅜	3·7⅛	3·7⅛	3·7⅛	3·7⅜	3·8⅛	3·9⅜	3·9	3·9⅛	3·9⅛	3·9⅛	3·11	3·11⅜	4·625	Bark fallen.
	19	,, ...	2·7⅛	2·8⅜	2·8⅛	2·8⅛	2·8⅛	2·8⅜	2·8⅛	2·9⅛	2·9⅜	2·9⅜	2·10⅜	2·10⅜	2·10⅜	2·11⅛	2·11⅛	4·0	Ditto.
	20	,, ...	1·3⅛	1·4	1·4	1·4	1·5⅛	1·5⅛	1·5⅜	1·6⅜	1·7⅜	1·7⅜	1·7⅛	1·7⅛	1·7⅛	1·8	1·8⅜	4·625	Ditto.
Carried over ...			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	74·500	

Measurements to ascertain the growth of Sal and Asseina—contd.

Name of ½ acre plot.	Number.	Description of Trees.	Measurements of girth at 5 feet from the ground.															Difference.	Remarks.
			10th May 1880.	1st to 12th December 1880.	February 1881.	4th June 1881.	10th December 1881.	13th March 1882.	6th June 1882.	December 1882.	March 1883.	June 1883.	December 1883.	March 1884.	June 1884.	March 1885.	March 1886.		
Brought forward			...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	74·500	
No. 3. Situated on the 10-foot fire conservancy line to Bonsripur, and about ¼ mile from Dudua—contd.	21	Sal ...	1·6¾	1·7¼	1·7¾	1·7¾	1·7¾	1·7¾	1·7¾	1·8¼	1·8⅝	1·8⅝	1·8½	1·8¼	1·8¼	1·8⅝	1·8½	3·0	Bark eaten by white ants.
	22	,, ...	2·10⅝	2·11	2·11	2·11	2·11⅛	2·11⅛	2·11⅛	3·0¼	3·0⅜	3·0⅜	3·1½	3·1⅝	3·1⅜	3·2⅝	3·3⅜	5·0	
	23	,, ...	1·10¼	1·10¼	1·10¼	1·10⅜	1·10⅝	1·11	1·11	1·11⅛	1·11⅛	1·11⅛	2·1	1·11¾	1·11½	2·0⅛	2·0⅝	2·625	Bark fallen.
	24	,, ...	1·4¾	1·4¾	1·5	1·5	1·5⅛	1·5⅛	1·5⅛	1·5⅜	1·5⅜	1·4¾	1·5⅛	1·5⅜	1·5⅛	1·5⅛	1·5⅛	·750	Ditto.
	25	,, ...	6·1⅞	6·1⅞	6·1⅞	6·1⅞	6·2⅜	6·2⅜	6·2⅜	6·2⅝	6·2⅝	6·2¾	6·3⅛	6·2¾	6·3¼	6·3⅛	6·3⅜	2·0	Ditto.
	26	,, ...	1·7⅜	1·8	1·8	1·8	1·8⅛	1·8⅛	1·8⅛	1·8⅜	1·9⅜	1·9	1·9⅛	1·9¼	1·9⅜	1·10	1·10⅜	2·750	Bark eaten by white ants.
	27	,, ...	1·7⅛	1·8¼	1·8¼	1·8⅜	1·7⅝	1·7⅛	1·7⅛	1·8	1·8⅛	1·8⅜	1·8⅛	1·8⅜	1·8⅛	1·9	1·8⅛	1·0	Bark fallen.
	28	,, ...	1·2⅜	1·3¼	1·3¼	1·3⅜	1·4⅜	1·4⅜	1·4⅜	1·4¼	1·5	1·4⅝	1·5⅛	1·5⅜	1·5⅛	1·6⅜	1·6⅜	4·0	Ditto.
	29	,, ...	1·1¾	1·3⅛	1·3⅛	1.3⅛	1·4⅜	1·4⅜	1·4⅜	1·5⅜	1·5⅜	1·5	1·6⅜	1·6⅜	1·6⅛	1·7⅛	1·8	6·125	Bark eaten by white ants.
	30	Asseina ...	5·0	5·0¼	5·7	5·0¼	5·2	5·2	5·2⅜	5·2⅛	5·2⅜	5·2⅛	5·3¼	5·3⅛	5·3⅜	5·4⅝	5·5⅛	5·125	
	31	Sal ...	3·5⅛	3·5¼	3·5⅜	3·5⅛	3·5⅜	3·5⅜	3·6	3·6	3·6⅜	3·6	3·6⅛	3·6⅛	3·6⅜	3·6⅛	3·6⅝	1·375	Bark fallen.
	32	,, ...	6·5⅜	6·6⅛	6·6⅛	6·6⅛	6·7⅝	6·7⅛	6·8	6·8⅛	6·8⅛	6·7⅝	6·9	6·8⅝	6·8⅝	6·10⅜	6·10⅛	5·375	Ditto.
Total ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	112·625	
Average per tree per annum.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	·503	

W. G. ALLAN,

Deputy Conservator of Forests, Kheri Division.

Kheri Division, Oudh Circle.

Measurements of 19 second class trees.

Situation in Forest.	Number.	Description of Trees.	Measurements of girth at five feet from the ground.															Difference.	Remarks.
			May 1880.	December 1880.	February 1881.	June 1881.	December 1881.	March 1882.	June 1882.	December 1882.	March 1883.	June 1883.	December 1883.	March 1884.	June 1884.	March 1885.	March 1886.		
All the trees are situated along the walls near Dudna.	1	Sál ...	4·10⅝	4·11⅝	5·0	5·0	5·0⅛	5·0⅝	5·0⅞	5·1⅛	5·1⅜	5·0⅝	5·2	5·1⅛	4·11⅞	5·3	5·3⅛	4·750	
	2	,, ...	4·11	4·11⅛	4·11⅛	4·11⅛	5·0⅛	5·0⅛	5·0⅛	5·0⅛	5·0⅛	4·11⅞	5·1⅜	5·1⅛	5·0	5·1⅛	5·1⅛	2·625	Bark fallen.
	3	,, ...	3·6⅛	3·7⅞	3·7⅛	3·7⅛	3·8⅛	3·8⅛	3·8⅛	3·8⅛	3·8⅝	3·8⅝	3·9⅛	3·9⅛	3·9⅛	3·10⅛	3·11⅛	5·0	
	4	,, ...	4·8⅝	4·9⅛	4·9⅛	4·9⅛	4·10⅛	4·10⅛	4·10⅛	4·10⅝	4·11	4·10⅞	4·11⅛	4·11⅛	4·11⅝	5·1	5·1⅝	5·125	
	5	,, ...	4·9	4·10	4·10	4·10	4·10⅞	4·10⅛	4·10⅝	4·10⅞	4·11⅛	4·10⅛	4·11⅞	4·11⅝	4·11⅜	5·0⅞	5·0⅝	3·500	Ditto.
	6	,, ...	3·10⅝	4·0⅛	4·0⅛	4·0⅝	4·3⅛	4·3⅛	4·3⅝	4·5	4·4⅛	4·4⅛	4·6⅞	4·6⅛	4·6⅝	4·8⅛	4·10⅛	11·875	
	7	,, ...	4·7⅜	4·9⅛	4·9⅛	4·9⅝	4·11⅜	4·11⅛	4·11⅝	5·1	5·1⅛	5·1⅛	5·2⅞	5·2⅛	5·2⅝	5·4⅜	5·5⅛	10·125	
	8	,, ...	6·4	6·5⅛	6·5⅛	6·5⅛	6·5⅛	6·5⅛	6·5⅝	6·5⅝	6·6⅛	6·6⅛	6·6⅞	6·6⅝	6·6⅛	6·7⅝	6·7⅝	3·750	Ditto.
	9	,, ...	5·7⅛	5·8⅝	5·8⅝	5·8⅝	5·9⅞	5·9⅞	5·10⅛	5·10⅜	5·10⅝	5·10⅝	5·11⅝	5·11⅛	5·11⅛	6·0⅝	6·0⅝	5·0	Ditto.
	10	,, ...	4·9⅝	4·10⅛	4·10⅛	4·10⅛	4·10⅝	4·10⅝	4·11	4·10⅞	4·10⅞	4·10⅝	4·11⅛	4·11⅛	4·11	5·0⅛	5·0⅛	2·750	Ditto.
	11	,, ...	4·0⅝	4·1⅛	4·1⅜	4·1⅜	4·1⅛	4·1⅞	4·1⅞	4·2⅜	4·2⅛	4·2⅛	4·3⅛	4·3⅛	4·3⅛	4·4⅜	4·4⅛	4·125	Ditto.
	12	,, ...	3·11⅜	4·0⅜	4·0⅛	4·0⅛	4·1⅛	4·1⅛	4·1⅝	4·1⅞	4·2	4·1⅛	4·2⅝	4·2⅛	4·2⅜	4·3⅛	4·4	4·750	Bark eaten by white ants.
	13	,, ...	3·6⅛	3·7⅛	3·7⅛	3·7⅛	3·8⅛	3·8⅛	3·8⅛	3·9	3·8⅛	3·8⅛	3·10⅛	3·10	3·9⅞	3·10⅞	3·11⅝	5·250	
	14	,, ...	4·3⅞	4·6⅛	4·6⅛	4·6⅛	4·9	4·9	4·9⅛	4·10⅛	4·10⅜	4·10⅛	5·1	5·0⅛	5·0⅛	5·2⅞	5·4⅛	12·250	
	15	,, ...	5·3⅛	5·5⅛	5·5⅛	5·5⅛	5·7	5.7	5·7⅛	5·7⅞	5·8⅛	5·7⅝	5·9⅝	5·9⅛	5·9⅛	5·10⅝	5·11⅛	7·750	
	16	,, ...	4·8⅛	4·9	4·9	4·9	4·9⅜	4·9⅝	4·9⅝	4·9⅞	4·9⅞	4·9⅛	4·10⅜	4·10	4·9⅞	4·10⅛	4·10⅛	1·750	Bark fallen.
	17	,, ...	4·8⅛	4·9⅛	4·9⅛	4·9⅛	4·11⅛	4·11⅜	4·11⅜	4·11⅝	4·11⅛	4·10⅞	5·0⅛	5·0⅛	5·0	5·1⅜	5·1⅜	5·125	Ditto.
	18	Salt ...	3·8⅛	3·10⅝	3·10⅝	3·11	4·1⅜	4·2⅛	4·2⅜	4·2⅜	4·2⅛	4·2⅛	4·4⅛	4·4⅛	4·4⅛	4·6⅛	4·6⅜	12·750	
	19	,, ...	4·10⅛	5·1⅛	5·1⅜	5·2⅛	5·5⅛	5·5⅜	5·5⅞	5·8⅛	5·8⅞	5·8⅛	6·0⅛	6·0⅜	6·0⅜	6·4	6·6⅛	19·875	
Total ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	128·125	
Average per tree per annum.	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	·963	

W. G. ALLAN,

Deputy Conservator of Forests, Kheri Division.

IMPROVEMENT FELLINGS.

Kheri Division, Oudh Circle, No. 4, 2-acre plot.

Measurements to ascertain the Growth of different Trees.

Name of 2-acre plot and exact situation in Forest Block.	Number.	Description of Trees.	Measurements of Girth at 5 feet from the ground.															Difference.	Remarks.
			May 1880.	December 1880.	February 1881.	June 1881.	December 1881.	March 1882.	June 1882.	December 1882.	March 1883.	June 1883.	December 1883.	March 1884.	June 1884.	March 1885.	March 1886.		
Sathiana line to Domohani line, and about 1 mile from Dudua.	1	Sal	2·7 3/8	2·8 1/4	2·8 3/4	2·8 3/4	2·10 1/8	2·10 3/8	2·10 3/8	2·11 3/8	2·11 3/8	2·11 1/8	3·0 1/2	3·0 1/8	3·0 1/2	3·1 1/8	3·2 1/8	7·375	
	2	"	2·9 3/8	2·10 1/4	2·11	2·11 1/8	3·0	3·0 1/8	3·0 1/8	3·1	3·1 3/8	3·1 1/8	3·1 7/8	3·2	2·11	3·2 7/8	3·3 1/4	6·125	
	3	"	1·7 3/8	1·8 1/8	1·8 1/8	1·8 1/8	1·9 1/4	1·10 1/8	1·10 1/8	1·10 3/8	1·10 3/8	1·10 3/8	1·11 3/8	1·11 1/8	1·11 3/8	2·0	2·0 1/8	4·875	
	4	"	2·9 1/8	2·10	2·10	2·10	2·10 1/8	2·10 1/8	2·10 1/8	2·10 1/8	2·11 3/8	2·11	2·11 3/8	2·11	2·11 3/8	3·0	3·0 1/4	3·250	
	5	"	1·1 3/8	1·2 1/8	1·2 3/8	1·2 1/8	1·2 1/8	1·2 3/8	1·2 3/8	1·3 1/8	1·3 1/8	1·3 1/8	1·3 1/8	1·3 1/8	1·3 3/8	1·4	1·4 1/8	2·750	
	6	"	1·2 1/8	1·3 1/8	1·3 1/8	1·3 1/8	1·4 1/8	1·4 1/8	1·4 1/8	1·5	1·5	1.4 7/8	1·5 1/8	1·5 1/8	1·4 1/8	1·6 1/8	1·7 3/8	4·875	
	7	"	1·8 1/8	1·9 1/8	1·9 1/8	1·9 1/8	1·10 1/8	1·10 1/8	1·10 1/8	1·10 1/8	1·10 1/8	1·10 1/8	1·11 1/8	1·11 1/8	1·10 7/8	2·0	2·0 1/8	3·375	Bark fallen.
	8	"	2·4	2·5 1/8	2·5 1/8	2·5 1/8	2·5 1/8	2·5 1/8	2·5 1/8	2·6 1/8	2·7	2·6 1/8	2·7 1/8	2·7 1/8	2·7 1/8	2·8 1/8	2·8 7/8	4·875	ditto.
	9	"	3·11 1/8	4·0 1/8	4·0 1/8	4·0 1/8	4·1 1/8	4·1 1/8	4·1 1/8	4·2 1/8	4·2 1/8	4·2 7/8	4·3 1/8	4·3 1/8	4·3 1/8	4·4 1/8	4·5	5·750	ditto.
	10	"	2·10 1/8	2·11 1/8	2·11 1/8	2·11 1/8	3·0 1/8	3·0 1/8	3·0 1/8	3·1	3·1 1/8	3.1 1/8	3·2 1/8	3·2	3·2 1/8	3·3	3·3 1/8	4·875	ditto.
	11	"	1·2	1·2 1/8	1·2 1/8	1.2 1/8	1·3 1/8	1·3 1/8	1·3 1/8	1·4 1/8	1·4 1/8	1·4 1/8	1·5 1/8	1·5 1/8	1·5 1/8	1·6 1/8	1·6 1/8	4·625	ditto.
	12	"	1·8 1/8	1·8 7/8	1·9	1·9 1/8	1·9 1/8	1·9 1/8	1·9 1/8	1·10 1/8	1·11	1·11 1/8	1·11 1/8	1·11 1/8	1·11 1/8	2·0 1/8	2·0 1/8	4·625	ditto.
	13	"	3·5	3.5 1/8	3·5 1/8	3·5 1/8	3·6	3·6		3·5 7/8	3·6 1/8	3·6 1/8	3·7	3·6 7/8	3·7	3·7 1/8	3·8 1/8	3·375	
	14	"	2·7 1/8	2.8 1/8	2·9 1/8	2·9 1/8	2·11	2·11	2·11 1/8	3·0 1/8	3·0 1/8	2·11 1/8	3·1 1/8	3·1 1/8	3·1 1/8	3·2 1/8	3·3 1/8	7·500	

No.	Situated on the 10-foot line in the improvement fellings from																	
15	"	2·5	2·5 2/8	2·6	2·6	2·7 1/8	2·7 1/8	2·7 1/8	2·8 2/8	2·9	2·7 1/8	2·9 1/8	2·9 1/8	2·9 1/8	2·10 2/8	2·11 1/8	6·625	
16	"	2·10 1/8	2·11 1/8	2·11 5/8	2·11 7/8	3·1 1/8	3·1 1/8	3·1 3/8	3·1 3/8	3·1 3/8	3·1 3/8	3·2 1/8	3·2 3/8	3·2 1/8	3.3 3/8	3·4 1/8	6·375	
17	"	2·1 1/8	2·1 3/8	2·1 7/8	2·1 7/8	2·2 3/8	2·2 3/8	2·2 7/8	2·3 1/8	2·2 7/8	2·2 7/8	2·3 1/8	2·3 3/8	2·3 3/8	2·3 5/8	2·4	2·875	Bark eaten by white ants.
18	"	1·9 1/8	1·10 3/8	1·10 1/8	1·10 1/8	2·0	2·0	2·0	2·1 3/8	2·1 3/8	2·0 5/8	2·2 1/8	2·2 3/8	2·2 1/8	2·3 3/8	2·4	6·875	
19	"	1·10 3/8	1·11	1·11	1·11	2·0	2·0	2·0	2·1	2·1	2·0 3/8	2·2	2·1 1/8	2·1 1/8	2·2 5/8	2·3 3/8	4·875	
20	"	1·3 1/8	1·3 7/8	1·3 7/8	1·3 7/8	1·3 3/8	1·3 7/8	1·3 7/8	1·4	1·4 3/8	1·4 3/8	1·4 3/8	1·4 1/8	1·4 3/8	1·4 3/8	1·4 7/8	1·250	Bark fallen.
21	"	1·1 3/8	1·1 7/8	1·2 1/8	1·2 1/8	1·2 3/8	1·2 5/8	1·2 5/8	1·3	1·3	1·3	1·3 3/8	1.3 3/8	1·3 3/8	1·4 3/8	1·4 3/8	3·375	
22	"	3·4 5/8	3·5 3/8	3·5 3/8	3·5 3/8	3·6 1/8	3·6 3/8	3·6 3/8	3·6 3/8	3·7	3·6 3/8	3·7 3/8	3·7 1/8	3·7 3/8	3·8	3·8 3/8	4·0	
23	"	2·2	2·3 3/8	2·3 3/8	2·3 7/8	2·4	2·4 1/8	2·4 1/8	2·5 1/8	2·5 7/8	2·5 3/8	2·6 3/8	2·6	2·6 3/8	2·6 7/8	2·7	5·750	
24	"	1·10 1/8	1·11 1/8	1·11 1/8	1·11 1/8	2·0 3/8	2·0 3/8	2·0 3/8	2·1 1/8	2·1 3/8	2·1 1/8	2·2 1/8	2·2 3/8	2·2 5/8	2·3	2·4	5·375	
25	"	2·3 3/8	2·4 1/8	2·4 1/8	2·4 1/8	2·3 5/8	2·3 5/8	2·3 7/8	2·4	2·4 3/8	2·4 3/8	2·4 1/8	2·4 1/8	2·4 3/8	2·4 1/8	2·4 7/8	1·125	Bark eaten by white ants.
26	"	1·3	1·3 3/8	1·4 1/8	1·4 1/8	1·4 3/8	1·4 3/8	1·4 3/8	1·5 1/8	1·5 1/8	1·5 1/8	1·6 1/8	1·6 3/8	1·6 1/8	1·7 1/8	1·7 1/8	4·875	
27	"	1·6 3/8	1·8	1·8 1/8	1·8 1/8	1·9 3/8	1.9 3/8	1·9 1/8	1·11 3/8	1·11 3/8	1·11 3/8	2·0 1/8	2·0 3/8	2·1	2·2 1/8	2·3 3/8	8·500	
28	"	1·7	1·7 1/8	1·7 3/8	1·7 3/8	1·8 1/8	1·8 3/8	1·8 3/8	1·8 1/8	1·8 3/8	1·8 3/8	1·9 1/8	1·9	1·9 1/8	1·9 3/8	1·9 7/8	2·875	
29	"	1·10 1/8	1·11 1/8	1·11 1/8	1·11 1/8	2·0 3/8	2·0 1/8	2·0 1/8	2·1 3/8	2·1 3/8	2·1 3/8	2·2 1/8	2·2 1/8	2·2	2·2 1/8	2·3 3/8	5·375	
30	"	1·7 3/8	1·8 3/8	1·8 1/8	1·8 1/8	1·8 1/8	1·9	1·8 3/8	1·9	1·9 3/8	1·9 3/8	1·9 3/8	1·9 3/8	1·9 3/8	1·9 3/8	1·9 1/8	2·0	
31	"	3·2 7/8	3·3 1/8	3·4	3·4 1/8	3·5 3/8	3·5	3·5 3/8	3·5 7/8	3·6	3·5 3/8	3·6 1/8	3·6 3/8	3·6 3/8	3·7	3·8	5·250	
32	"	1·8 1/8	1·9 1/8	1·9 1/8	1·9 3/8	1·10	1·10 1/8	1·10 1/8	1·11	1·11	1·10 3/8	1·11 1/8	1·11 3/8	1·11 1/8	2·0 3/8	2·0 3/8	3·750	Bark fallen.
33	"	2·10 1/8	2·11 3/8	2·11 1/8	2·11 1/8	2·11 1/8	2·11 3/8	2·11 1/8	3·1	3·1 7/8	3·1 1/8	3·2 1/8	3·2 3/8	3·2 3/8	3·3 1/8	3·4 1/8	6·500	
34	...	1·2 3/8	1·3	1·3	1·3 1/8	1·3 7/8	1·4 1/8	1·4 1/8	1·4 1/8	1·4 3/8	1·4 3/8	1·5	1·5	1·5	1·6	1·6	3·750	Ditto.
Total ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	159·625
Average per tree per annum ...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	·671

IMPROVEMENT FELLINGS.

Kheri Division, Oudh Circle, No. 4, 2-acre plot—continued.

Measurements to ascertain the Growth of different Trees.

Name of 2-acre plot and exact situation in Forest Block.	Number.	Description of Trees.	Measurements of Girth at 5 feet from the ground.									Difference.	Remarks.
			June 1881.	December 1881.	June 1882.	December 1882.	June 1883.	December 1883.	June 1884.	March 1885.	March 1886.		
Sathiana line to Domohani line, and about 1 mile from Dudua.	35	Rohni ...	2·1½	2·2	2·2½	2·2⅞	2·2½	2·3½	2·3⅞	2·3⅞	2·3⅞	2·625	
	36	Sál ...	1·7½	1·8½	1·8⅞	1·9	1·8½	1·9⅞	1·9½	1·10	1·10½	2·375	Bark eaten by white ants.
	37	" ...	1·2½	1·2	1·2⅞	1·3⅞	1·3½	1·3½	1·3½	1·4⅞	1·4⅞	2·625	Ditto ditto.
	38	" ...	1·2½	1·2½	1·2⅞	1·2⅞	1·2⅞	1·3	1·3⅞	1·3⅞	1·3⅞	1·375	Bark fallen.
	39	" ...	0·10½	0·11½	0·11½	0·11⅞	0·11½	1·0½	1·0⅞	1·0⅞	1·1½	2·625	
	40	" ...	1·0⅞	1·1½	1·1½	1·1⅞	1·1⅞	1·2⅞	1·2⅞	1·2⅞	1·3⅞	2·750	
	41	" ...	1·9⅞	1·10½	1·10½	1·11⅞	1·11⅞	2·0⅞	2·0⅞	2·1⅞	2·1½	4·625	Ditto.
	42	" ...	2·10½	2·11⅞	2·11⅞	3·0⅞	3·0⅞	3·2⅞	3·2⅞	3·3⅞	3·4⅞	5·875	
	43	" ...	1·3⅞	1·4	1·4½	1·4⅞	1·4⅞	1·4⅞	1·4½	1·4⅞	1·4⅞	·625	Bark eaten by white ants.
	44	" ...	9·1½	9·3	9·3	9·4⅞	9·3⅞	9·5	9·5⅞	9·5⅞	9·5½	4·250	
	45	" ...	1·7⅞	1·9	1·9⅞	1·11⅞	1·11½	2·1½	2·2	2·3½	2·5⅞	9·500	
	46	" ...	1·8⅞	1·9⅞	1·9½	1·10⅞	1·11½	2·0⅞	1·9½	2·2⅞	2·3⅞	7·0	
	47	" ...	1·1	1·1½	1·1½	1·2½	1·2⅞	1·3½	1·3⅞	1·3½	1·4	3·0	Bark fallen.
	48	" ...	1·4½	1·6½	1·6½	1·7½	1·7⅞	1·9⅞	1·9⅞	1·11	2·0½	7·250	
	49	" ...	1·2⅞	1·3½	1·3½	1·3⅞	1·3⅞	1·3⅞	1·3⅞	1·3½	1·4½	1·875	
	50	" ...	0·10⅞	0·11	0·11	1·1⅞	1·1½	1·1	1·1⅞	1·2⅞	1·3½	4·375	
	51	" ...	1·10½	1·11½	1·11½	2·1⅞	2·1⅞	2·3	2·3½	2·4⅞	2·5½	7·125	
	52	" ...	1·6⅞	1·7⅞	1·7½	1·9⅞	1·9⅞	1·10⅞	1·11	2·0⅞	2·1⅞	7·0	
	53	" ...	0·11½	0·11⅞	0·11⅞	0·11½	0·11½	1·0½	1·0½	1·0⅞	1·0½	1·750	
	54	" ...	1·4½	1·5½	1·5⅞	1·6	1·6⅞	1·7	1·7½	1·8½	1·7½	3·0	Ditto.
	55	" ...	0·11½	1·0½	1·0½	1·1⅞	1·1½	1·3⅞	1·3⅞	1·4⅞	1·5⅞	6·125	
	56	" ...	0·10½	0·11	0·11	0·11½	0·10⅞	0·11½	0·11	0·11½	0·11½	·250	Ditto.
	57	" ...	0·11½	0·11⅞	0·11⅞	0·1	1·0	1·0⅞	1·0⅞	1·0⅞	1·1	1·625	

No.	Situated on the 10-foot line in the improvement fellings from											
58	,, ...	1·0⅝	1·1⅝	1·1⅝	1·2	1·1⅝	1·3⅝	1·2⅝	1·3	1·3⅝	3·125	
59	,, ...	1·1⅛	1·2⅛	1·2⅝	1·3⅛	1·3	1·3⅝	1·3⅝	1·4	1·4⅝	2·625	
60	,, ...	1·1⅝	1·2	1·2⅛	1·2⅝	1·2⅝	1·3⅝	1·3⅝	1·4	1·3⅝	1·750	Bark eaten by white ants.
61	,, ...	1·0⅝	1·0⅞	1·1	1·1⅛	1·1	1·1⅛	1·1⅛	1·1⅛	1·1⅞	1·500	Ditto ditto.
62	,, ...	1·0⅛	1·1⅝	1·1⅛	1·1⅝	1·1⅝	1·2⅛	1·2⅝	1·2⅝	1·4⅝	3·750	
63	,, ...	1·1⅛	1·2⁰	1·2⅛	1·3⅝	1·3⅝	1·4⅝	1·4⅝	1·4⅝	1·5⅝	3·750	
64	Sidhua ...	4·4	4·4⅛	4·4⅝	4·4⅝	4·4	4·4⅞	4·4⅛	4·5⅝	4·5⅛	1·225	Bark fallen.
65	Asseina ...	2·5⅞	2·7	2·7	2·8⅝	2·8⅝	2·10	2·9⅝	2·11⅛	3·0⅝	6·375	
66	Sál ...	1·5⅛	1·5⅛	1·5⅛	1·5⅝	1·6⅛	1·6⅝	1·6⅝	1·6⅞	1·7	1·625	Ditto.
67	,, ...	0·10⅝	0·10⅝	0·10⅝	1·10⅝	0·10⅝	0·10⅝	0 11	0·11⅝	0·11⅞	1·625	Ditto.
68	,, ...	0·8⅞	0·9	0·9	0·9⅝	0·9⅝	0·9⅝	0·9⅝	0·10	0·10⅝	1·625	
69	,, ...	1·9⅝	1·10⅛	1·11	1·11⅞	2·0⅝	2·2⅝	2·2⅝	2·4⅝	2·6⅝	8·500	
70	Parar ...	5·8⅛	5·8⅝	5·8⅝	5·9⅝	5·8⅝	5·10	5·9⅛	5·10⅝	5·10	1·875	Ditto.
71	Sál ...	2·2⅛	2·3⅝	2·3⅝	2·4⅝	2·5	2·6⅝	2 6⅝	2·8⅛	2·9⅝	7·125	
72	,, ...	1·0⅝	1·1⅝	1·1⅝	1·2⅞	1·3⅝	1·4⅝	1·4⅞	1·6	1·7⅝	7·0	
73	,, ...	1·2⅛	1·2⅝	1·3⅝	1·4⅝	1·4⅝	1·5⅝	1·5⅝	1·6⅝	1·6⅞	4·750	
74	,, ...	0·11	0·11⅛	0·11⅛	0·11⅝	0·11⅞	1·0⅛	1·0⅝	1·0⅝	1·0⅞	11·875	Bark eaten by white ants.
75	,, ...	7·5⅛	7·5⅛	7·5⅝	7·5⅛	7·5⅝	7·6⅝	7·6⅝	7·6⅝	7·6⅝	1·625	Bark fallen.
76	,, ...	2·1⁰	2·2⅝	2·2⅝	2·5	2·5⅝	2 7⅝	2·7⅝	2·9	2·10⅝	9·250	
77	,, ...	1·7⅛	1·8⅝	1·8⅛	1·10	1·9⅞	1·10⅞	1·10⅝	2·0	2·0⅞	5·0	
78	,, ...	1·8⅛	1·8⅞	1·8⅝	1·10⅝	1·10⅝	1·11⅝	1 11⅝	2 0⅝	2 1⅝	5·125	
79	,, ...	1·2	1·2⅛	1·2⅛	1·3⅝	1·2⅝	1·3⅛	1·3⅝	1·4⅛	1·4⅝	2·500	Ditto.
80	,, ...	1·6⅞	1·7⅝	1·7⅝	1·8⅛	1·8⅝	1·8⅞	1·9⅛	1·9⅞	1·10	3·125	Ditto.
81	,, ...	1·4⅛	1·5	1·5	1·5⅝	1·6⅛	1·6⅛	1·6⅛	1·6⅝	1 6⅝	1·875	Ditto.
82	,, ...	1·9⅛	1·9⅞	1·9⅞	1·11	1·11⅛	2·0⅞	2·0⅛	2·1⅝	2·2	4·875	Bark eaten by white ants.
83	,, ...	2·2⅛	2·3⅛	2·3⅛	2·4	2·3⅞	2·4⅝	2·4⅝	2·5⅝	2·6	2·375	
84	,, ...	1·3⅝	1·3⅝	1·3⅞	1·4⅝	1·4⅝	1·4⅞	1·4⅝	1·5	1·5⅛	1·750	Ditto.
85	,, ...	0·11	0·11	0·11	0·11⅝	1·0	0·11⅞	1·0⅛	1·0⅛	1·0⅝	1·500	
86	,, ...	1·5⅛	1·6⅛	1·6⅛	1·7⅛	1·8⅝	1·9	1·8⅝	1·10	1·10⅝	4·875	
87	,, ...	1·6	1·6⅝	1·6⅛	1·6⅝	1·6⅛	1·6⅞	1·6⅝	1·6⅞	1·7⅝	1·250	
88	,, ...	1·8⅝	1·8⅝	1·8⅝	1·9⅛	1·9⅞	1·10⅛	1·10⅝	1·11⅝	2·0⅝	4·250	
89	,, ...	1·1⅛	1·1⅝	1·1⅛	1.2⅛	1·2⅛	1·3⅝	1·3⅝	1·4⅛	1·5⅛	3·750	
90	,, ...	2·0⅛	2·1⅝	2·1⅛	2·2⅛	2·2⅛	2·3⅛	2·3⅝	2·4	2·4⅝	4·125	
91	Kumbhia	4·2⅛	4·2⅝	4·2⅝	4·2⅞	4·2⅝	4·2⅞	4·2⅞	4·3	4·2⅝	·625	Bark fallen.
92	Sál ...	7·9⅛	7·9⅛	7·9⅞	7·10	7·9⅛	7·10⅞	7·10⅛	7·11⅛	7·11⅝	2·125	Ditto.
93	,, ..	2·6⅝	2·7⅝	2·7⅝	2·7⅝	2·8	2·9⅛	2 9	2·10⅛	2·11⅝	4·750	
94	,, ...	1·8⅝	1·9	1·9	1·10	1·10⅛	1·10⅞	1·11⅝	1·11⅛	2·0⅝	3·500	

Measurements to ascertain the Growth of different Trees—contd.

Name of 2-acre plot and exact situation in Forest Block.	Number.	Description of Trees.	Measurements of Girth at 5 feet from the ground.										Remarks.
			June 1881.	December 1881.	June 1882.	December 1882.	June 1883.	December 1883.	June 1884.	March 1885.	March 1886.	Difference.	
Sathiana line to Domohani line, and about 1 mile from Dudua.	95	Sál ...	1·10¾	1·11	1·11	1·11½	1·11½	2·0½	1·11½	2·0¾	2·0½	2·375	
	96	„ ...	0·10¾	0·11¾	0·11¾	0·11¾	0·11¾	1·0¼	1·0¾	1·1¾	1·1½	2·750	
	97	„ ...	2·6¼	2·7¾	2·7¾	2·9	2·9	2·10¾	2·10¾	2·11¾	3·0½	6·375	
	98	„ ...	0·11½	1·0½	1·0½	1·1½	1·1½	1·2¾	1·2¾	1·3¾	1·4¾	4·875	
	99	„ ...	1·1¾	1·1¾	1·2	1·2¾	1·2¾	1·3¾	1·3¾	1·4¾	1·5½	4·125	
	100	„ ...	0·11¾	1·0½	1·1	1·1¾	1·1¾	1·0½	1·0¾	1·1½	1·1¾	1·500	Dried.
	101	„ ...	1·1½		1·1½	1·1½	1·1¾	1·1½	1·1¾	1·2	1·2½	1·0	Ditto.
	102	„ ...	0·11½	1·0½	1·0½	1·0¾	1·0¾	1·1¾	1·1¾	1·2½	1·3	3·500	
	103	„ ...	2·0¾	2·2	2·2	2·3¾	2·3½	2·4½	2·5½	2·5¾	2·6¾	5·875	Bark eaten by white ants.
	104	„ ...	1·1½	1·2	1·2	1·2½	1·2¾	1·3½	1·3½	1·4	1·4½	2·750	Bark fallen.
	105	Madumwa	5·1½	5·2½	5·2½	5·2½	5·2¾	5·3¾	5·3¾	5·3½	5·3½	1·500	Ditto.
	106	Sál ...	0·10¾	0·11	0·11½	0·11½	0 11¾	1·0¾	1·0½	1·1	1·0½	2·375	Ditto.
	107	„ ...	2·1¾	2·2	2·2	2·1¾	2·1½	2·2½	2·2¾	2·2¾	2·2½	1·125	Ditto.
	108	„ ...	1·5¾	1·5¾	1·5·	1·6½	1·6¾	1·7	1·7½	1·7¾	1·8	2·500	
	109	„ ...	1·4¾	1·5¾	1·5¾	1	1·6½	1·8¾	1·7½	1 9½	1·10	5·750	
	110	„ ...	0·10½	0·11¾	0·11¾	1·0½	1·0¾	1·0¾	1·0½	1·1¾	1·2¾	3·375	
	111	„ ...	2·0¾	2·1¾	2·1¾	2·2¾	2·2½	2·3½	2·3¾	2·4¾	2·5¾	5·0	Bark eaten by white ants.
	112	„ ...	2·5	2·5½	2·5½	2·7¾	2·7½	2·8½	2·8½	2·10½	2·11½	6·125	
	113	„ ...	4·1½	4·2½	4·2½	4·2¾	4·2¾	4·3½	4·3	4·4½	4·5¾	3·875	
	114	„ ...	2·0½	2·10¾	2·10¾	3 0	3·0¾	3·1½	3·1¾	3·2½	3·3½	6·0	
	115	„ ...	2·8¾	2·9¾	2·9¾	2·10½	2·10½	3·0¾	3·0¾	3·1½	3·3	6·500	
	116	„ ...	5·10¾	5·11¾	5·11¾	5·11¾	5·11¾	6·1½	5·11½	6·0¾	6·1½	2·625	Knot has come out where measurement is taken.
	117	Parar ...	4·0¾	4·1¾	4·1¾	4·2¾	4·2¾	4·3½	4·3½	4·4¾	4·4¾	4·125	Bark eaten by white ants.
	118	Sál ...	3·3¾	3·3½	3·3½	3·4½	3·4½	3·5½	3·6	3·7	3·8	4·875	
	119	„ ...	4·1¾	4·2½	4·2¾	4·2½	4·2¾	4·3½	4·3¾	4·3½	4·4½	2·375	
	120	„ ...	1·0¾	1·0¾	1·0¾	1·0½	1·1	1·1½	1·1¾	1·1¾	1·2½	2·0	
	121	„ „	0·9½	0·10½	0·10½	1 0	1·0¾	1·0¾	1·0½	1·1½	1·2½	4·750	

No.		Situated on the 10-foot line in the improvement fellings from											
122	,,	...	1·0⅛	1·1⅛	1·1⅛	1·1⅞	1·1⅞	1·2⅞	1·3	1·3¼	1·3½	3·500	Bark fallen.
123	,,	...	1·0⅛	1·0⅞	1·0⅞	1·1¼	1·1⅝	1·2	1·2¾	1·2¾	1·3½	2·750	
124	,,	...	7·3⅞	7·4¾	7·4¾	7·4¾	7·4¾	7·5¾	7·5⅞	7·6½	7·6¾	2·875	Ditto.
125	Kari	...	1·0½	1·2	1·2	1·2⅛	1·3	1·3½	1·3⅞	1·4¾	1·4¾	3·625	Bark eaten by white ants.
126	Sál	...	2·5	2·6¼	2·6¼	2·7⅛	2·7⅛	2·9½	2·8½	2·10¾	2·11¼	6·500	
127	,,	..	2·3⅛	2·4½	2·5	2·6¾	2·6¾	2·8¾	2·8⅛	2·10	2·10¾	6·625	Bark fallen.
128	,,	...	1·2	1·2½	1·2¾	1·3	1·3⅛	1·3½	1·3¾	1·4½	1·5	3·0	
129	,,	...	5·4	5·4¼	5·4¼	5·5½	5·5¾	5·6½	5·7	5·7⅛	5·8	4·0	
130	,,	...	2·3⅞	2·4½	2·5	2·5⅞	2·5⅞	2·7⅛	2·7½	2·9½	2·9¾	5·375	
131	,,	..	2·4¼	2·5⅛	2·5⅛	2·6¾	2·7	2·9½	2·8¾	2·6½	2·10	5·500	
132	,,	...	3·0¾	3·1½	3·1⅞	3·2½	3·2¾	3·4½	3·3½	3·4¾	3·5¾	4·750	
133	,,	...	3·1⅛	3·2½	3·2½	3·3⅛	3·2⅞	3·4½	3·4¼	3·5¾	3·6¾	4·875	
134	,,	...	4·7	4·8½	4·8½	4·9	4·8¾	4·9⅞	4·9⅞	4·10¾	4·10⅞	3·875	Ditto.
135	,,	...	1·11¾	2·0¾	2·0¾	2·1⅞	2·2¾	2·3¾	2·3½	2·4¾	2·6½	6·875	
136	,,	...	1·2	1·2⅞	1·2⅞	1·3¾	1·3½	1·4⅛	1·4½	1·5	1·5¼	3·500	
137	,,	.	1·3½	1·3¾	1·3⅞	1·4½	1·4¾	1·4⅞	1·4⅞	1·5½	1·6	2·625	
138	,,	..	1·4½	1·5¼	1·5½	1·7⅛	1·7¼	1·9	1·9	1·10½	1·10¾	6·125	
139	,,	..	1·2⅛	1·3½	1·3¾	1·5	1·5½	1·6½	1·6½	1·7¾	1·7½	5·5·0	
140	,,	...	2·3¾	2·4¾	2·4¾	2·6¼	2·6¼	2·8½	2·8¾	2·10¾	3·0½	8·875	
141	,,	...	6·10⅛	6·10⅞	6·11	6·11¾	6·10⅞	7·0	6·11¾	7·0½	7·0¾	1·875	Ditto.
142	,,	...	2·5½	2·5¾	2·5½	2·6¾	2·6½	2·7⅛	2·7¼	2·8	2·8½	3·500	
143	,,	..	1·3	1·3¼	1·3¾	1·4	1·4½	1·4½	1·4½	1·5½	1·5¼	2·250	Ditto.
144	,,	...	2·4	2·4¾	2·4¾	2·5¾	2·5¾	2·6¾	2·6½	2·7¾	2·8	4·0	
145	,,	...	1·8½	1·8½	1·8½	1·8½	1·8¾	1·9¾	1·9¾	1·9¾	1·9¾	1·125	
146	,,	...	1·11¼	2·1	2·1	2·1¾	2·1¾	2·2¾	2·1½	2·3½	2·3¾	4·250	
147	,,	...	1·3⅞	1·4½	1·4½	1·4¾	1·4½	1·5½	1·5	1·6	1·6¾	2·375	
148	,,	...	1·8¾	1·9	1·9½	1·9½	1·10	1·10	1·10½	1·10¾	1·11	2·250	
149	,,	...	1·9½	1·10	1·10	1·10½	1·10½	1·11½	1·11½	2·0	2·0¾	3·125	Ditto.
150	,,	...	1·2½	1·2¾	1·2¾	1·3¾	1·3¾	1·3½	1·3¾	1·3¾	1·3½	1·0	Ditto.
151	,,	...	1·7½	1·8¾	1·8¾	1·9¾	1·9¾	1·10	1·10	1·11	1·11¾	3·875	Ditto.
152	,,	...	1·4½	1·4½	1·4½	1·4½	1·4½	1·4¾	1·5	1·5	1·5½	·750	
153	,,	...	1·0¾	1·1½	1·1¾	1·1½	1·1¾	1·2¾	1·2½	1·2½	1·2¾	2·125	Ditto.
154	,,	...	2·11½	3·0½	3·0½	3·1¾	3·1¾	3·3½	3·3½	3·4¾	3·5	5·375	
155	,,	...	2·7¾	2·8¾	2·8½	2·9½	2·9½	2·11¾	2·10¾	3·0¾	3·1½	5·625	
156	,,	...	1·4½	1·4½	1·4¾	1·5½	1·5¾	1·5½	1·5½	1·6	1·6½	1·750	Ditto.
157	,,	...	6·5½	6·5½	6·5½	6·6½	6·6½	6·6½	6·6¾	6·7	6·7	1·875	Ditto.

Measurements to ascertain the Growth of different Trees—contd.

Name of 2-acre plot and exact situation in Forest Block.	Number.	Description of Trees.	Measurements of Girth at 5 feet from the ground. June 1881.	December 1881.	June 1882.	December 1882.	June 1883.	December 1883.	June 1884.	March 1885.	March 1886.	Difference.	Remarks.
Sathiana line to Domohani line, and about 1 mile from Dudua.	158	Sál ...	1·4¾	1·6	1·6½	1·0¾	1·7¾	1·8½	1·8¾	1·9	1·9¾	5·0	
	159	,, ...	1·3¾	1·4¾	1·4¾	1·6¾	1·7	1·8½	1·8¾	1·9¾	1·10⅝	6·500	
	160	,, ...	5·9⅝	5·10½	5·10½	5·10⅝	5·10	5·10¾	5·10¾	5·11½	5·11¾	2·125	Bark fallen.
	161	,, ...	1·4	1·4¾	1·4½	1·5¾	1·5¾	1·6	1·6½	1·6¾	1·7½	3·625	
	162	,, ...	1·2¾	1·2½	1·2½	1·3½	1·3½	1·3¾	1·4½	1·4¾	1·5	2·750	
	163	,, ...	2·2½	2·3½	2·3¾	2·4½	2·4	2·5¾	2·5¾	2·6	2·6¾	4·250	
	164	,, ...	3·2½	3·2¾	3·3½	3·3½	3·3½	3·4½	3·4¾	3·5½	3·6½	4·500	
	165	,, ...	1·3	1·2½	1·2½	1·2½	1·2¾	1·3¾	1·2¾	1·3½	1·3¾	1·875	
	166	,, ...	1·11	2·0	2·0	2·1¾	2·1¾	2·3	2·3¾	2·3½	2·4¾	5·750	
	167	,, ...	1·2¾	1·3¾	1·3¾	1·4½	1·4½	1·5½	1·6½	1·6½	1·6½	4·375	
	168	,, ...	1·3¾	1·4	1·4	1·5¾	1·5¾	1·6¾	1·6½	1·7¾	1·8¾	5·250	
	169	,, ...	1·6¾	1·7½	1·7½	1·8¾	1·8¾	1·9¾	1·9¾	1·10¾	1·10½	4·0	
	170	,, ...	1·0¾	1·0¾	1·0½	1·1	1·1¾	1·1½	1·1½	1·1¾	1·2	1·250	
	171	,, ...	1·5½	1·5¾	1·5½	1·6¾	1·6½	1·7½	1·7½	1·7¾	1·8½	3·0	Bark eaten by white ants.
	172	Asseina ...	1·2½	1·3¾	1·3½	1·4½	1·3½	1·4¾	1·4½	1·5½	1·5¾	2·875	Bark fallen.
	173	Sál ...	2·7½	2·8½	2·8½	2·10½	2·10½	2·11¾	2·11¾	3·0¾	3·1¾	6·375	
	174	,, ...	1·7	1·8	1·8	1·8½	1·7¾	1·8¾	1·8¾	1·9	1·9¾	2·250	Ditto.
	175	,, ...	1·6¾	1·7¾	1·7¾	1·8½	1·8½	1·9	1·9	1·10	1·10¾	4·0	
	176	Asseina ...	1·7¾	1·9	1·9	1·10	1·9½	1·11½	1·11½	2·0½	2·1½	5·875	
	177	Sál ...	1·7¾	1·8¾	1·8½	1·9¾	1·9½	1·10½	1·10¾	1·11	1·11¾	4·250	Bark eaten by white ants.
	178	,, ...	1·3¾	1·3¾	1·3½	1·3½	1·3½	1·4¾	1·4½	1·4½	1·5	1·750	Bark fallen.
	179	,, ...	3·3¾	3·2¾	3·3¾	3·4½	3·4½	3·4¾	3·4½	3·5¾	3·6½	3·125	
	180	,, ...	1·1½	1·1¾	1·1¾	1·1¾	1·1½	1·1½	1·1½	1·1½	1·2	·625	Bark eaten by white ants.
	181	,, ...	1·3½	1·3½	1·3½	1·3¾	1·3¾	1·4	1·4½	1·4½	1·4½	1·500	Bark fallen.
	182	,, ...	2·0	2·1½	2·1½	2·2¾	2·2½	2·3½	2·3¾	2·5½	2·5½	5·875	
	183	,, ...	1·3½	1·3¾	1·3¾	1·3¾	1·3½	1·4	1·3½	1·4½	1·4½	1·500	Ditto.
	184	,, ...	1·0¾	1·0½	1·0½	1·0¾	1·0½	1·2½	1·2½	1·2½	1·3	2·750	
	185	,, ...	1·1½	1·2	1·2	1·2½	1·2½	1·3½	1·3½	1·4½	1·4¾	2·875	Bark eaten by white ants.

No.	Situated on the 10-foot line in the improvement fellings from											
156	,, ...	5 9	5·10½	5·10⅝	5·10⅝	5·10	5 11½	5·10¾	5·11	5·11	1·875	Bark fallen.
187	Sidhua ...	1·8	1·8½	1·8	1·8⅞	1·9	1·9	1·9½	1·9½	1·9	1·625	Ditto.
188	Sál ...	3·6	3·6½	3·6½	3·7	3·6½	3·7½	3·7½	3·8	3·9	4·625	
189	,, ...	1·1½	1·1	1·1¼	1·2	1·2	1·3	1·3	1·4½	1·5	3·625	
190	,, ...	1·3½	1·4	1·4	1·4	1·5	1·5½	1·5¾	1·6½	1·6	2·875	Bark fallen.
191	Asseina ...	2·6	2·7½	2·7½	2·8	2·8½	2·10½	2·10	2·11	2·11	4·750	Ditto.
192	Sál ...	1·0	1·0½	1·0½	1·1	1·1	1·2	1·2½	1·2	1·3½	2·875	
193	,, ...	1·11	1·11½	1·11	2·1	2·0½	2·2	2·1½	2·3	2·4	5·0	
194	,, ...	1·5	1·5½	1·6	1·7	1·7½	1·9	1·9½	1·10½	2·0	6·750	
195	,, ...	2·2	2·3	2·3	2·4½	2·4½	2·6	2·6	2·7½	2·8	6·625	
196	...	1·6½	1·9	1·9	1·10	1·10	2·0	2·0½	2·1½	2·1¾	5·375	Bark eaten by white ants.
197	,, ...	1·1½	1·2	1·2	1·3½	1·2½	1·3½	1·3	1·4	1·4½	2·500	
198	Asseina ...	1·10	1·11	2·0	2·0	2·0	2·1½	2·1	2·2	2·3	4·750	Bark fallen.
199	Sál ...	1·3	1·4½	1·4½	1·5½	1·4½	1·5½	1·5½	1·6½	1·7	3·500	Bark eaten by white ants.
200	,, ...	1·6½	1·7½	1·7½	1·9	1·8½	1·10½	1·10½	1·11½	2·0½	5·750	
201	,, ...	1·3½	1·4	1·4½	1·4½	1·4½	1·5½	1·5½	1·6	1·6	2·875	Ditto ditto.
202	,, ...	1·3½	1·3½	1·3½	1·4½	1·4	1·5	1·5½	1·6½	1·6½	3·250	
203	,, ...	1·2	1·2½	1·2½	1·3½	1·3½	1·4½	1·4½	1·4½	1·5	3·0	
204	,, ...	1·11½	2·0	2·0	2·2	2·2	2·4	2·4½	2·5½	2·6½	7·750	
205	,, ...	1·2½	1·3	1·3	1·4½	1·3½	1·4½	1·4½	1·5½	1·5½	2·750	Bark fallen.
206	,, ...	1·1	1·2	1·2½	1·2½	1·2½	1·3½	1·3	1·3½	1·4½	2·875	Ditto.
207	,, ...	1·1½	1·2	1·2	1·2	1·2½	1·3	1·3	1·4	1·4½	3·0	
208	,, ...	1·9	1·9½	1·10	1·11	1·11	2·0	2·0½	2·1	2·1½	4·625	
209	,, ...	1·1	1·1½	1·1	1·2	1·2	1·3	1·2½	1·3½	1·3½	2·625	
210	,, ...	2·6	2·6	2·6	2·7	2·7	2·5½	2 8	2·9	2·11	5·0	
211	,, ...	1·9	1·10	1·10½	1·11	1·11	2·0½	2·0	2·1½	2·2	4·500	
212	,, ...	1·1½	1·1½	1·1	1·2	1 2	1·3	1·3	1·3½	1·4½	3·125	
213	,, ...	4·2	4·3	4·3½	4·3	4·3	4·4	4·4	4·4½	4·4½	2·125	Ditto.
214	,, ...	2·1½	2·2½	2·2	2·3½	2·4	2·5½	2·5½	2·7	2·8	7·125	
215	,, ...	3·11	4·1	4·1½	4·2	4·1½	4·2	4·1	4·3½	4·3½	4·875	Ditto
216	,, ...	2·2	2·3½	2·3½	2·5½	2·5½	2·7½	2·7	2·8½	2·10	7·500	
217	,, ...	1·10	1·10½	1·11½	2·0	2·0½	2·1½	2·1	2·2½	2·3½	5·250	Bark eaten by white ants.
218	,, ...	1·1½	1·2	1·2½	1·3	1·3½	1·4	1·4½	1 5½	1·5½	4·0	
219	,, ...	1·3½	1·3	1·3½	1·4½	1·4½	1·4½	1·5	1·5½	1·6½	3·125	
220	Chajul ...	1·5	1·5	1·5	1·5	1·5	1·6	1·5½	1·6	1·6	1·250	Bark fallen.
221	Sál ...	1·0	1·0½	1·0½	1·1	1·1	1·1	1·1	1·2	1·2	2·250	Bark eaten by white ants.
222	,, ...	2·7	2·9	2·9½	2·10	2·11½	3·0	3·0	3·0	3·1½	5·500	Ditto ditto.

Measurements to ascertain the Growth of different Trees—concld.

Name of 2-acre plot and exact situation in Forest Block.	Number.	Description of Trees.	Measurements of girth at 5 feet from the ground. June 1881.	December 1881.	June 1882.	December 1882.	June 1883.	December 1883.	June 1884.	March 1885.	March 1886.	Difference.	Remarks.
No. 4. Situated on the 10-foot line in the improvement fellings from Sathiana line to Domohani line, and about 1 mile from Dudna.	223	Sál ...	5·8 3/4	5·9 3/4	5·9 3/4	5·9 3/4	5·9 1/8	5·10 3/4	5·10 1/2	5·9 7/8	5·11	2·250	Bark fallen.
	224	" ...	1·6 3/4	1·7 7/8	1·7 7/8	1·8 3/4	1·8 3/4	1·9 5/8	1·9 1/8	1·10 3/8	1·11	4·500	
	225	" ...	1·9 3/4	1·9 7/8	1·9 7/8	1·11	1·11 1/8	1·11 7/8	2·0 5/8	2·1 1/8	2·1 7/8	4·625	Bark eaten by white ants.
	226	" ...	1·3 3/4	1·4 5/8	1·4 5/8	1·4 7/8	1·4 5/8	1·5	1·5 1/8	1·5 5/8	1·6 3/8	2·500	
	227	" ...	2·3 3/4	2·4 1/2	2·4 1/2	2·5 1/8	2·4 1/2	2·5 3/4	2·5 1/8	2·6	2·6 1/2	2·750	
	228	" ...	1·5 3/4	1·6	1·6	1·7 3/4	1·7 1/4	1·8 5/8	1·8 3/8	1·10	1·11	5·750	Ditto ditto.
	229	" ...	1·5 1/8	1·5 1/2	1·5 1/2	1·6 1/2	1·6 5/8	1·7 1/4	1·7 3/8	1·8 5/8	1·8 7/8	3·750	Ditto ditto.
	230	" ...	0·11 7/8	1·0 1/8	1·0 1/8	1·0 3/4	1·0 3/4	1·0 5/8	1·1 1/8	1·1 1/8	1·1 1/8	1·750	
	231	" ...	1·0	1·0 1/4	1·0 1/4	1·1	1·1 1/4	1·1 7/8	1·2 1/8	1·3	1·3 1/8	3·625	Bark fallen.
	232	" ...	1·2 1/8	1·2 1/8	1·2 3/8	1·3 1/8	1·3 1/8	1·4 1/8	1·4 3/8	1·5 3/8	1·6 1/8	4·0	
	233	" ...	1·1 1/8	1·2 3/8	1·2 3/8	1·4 3/8	1·3 3/8	1·5 1/8	1·5 1/8	1·7	1·7 1/8	6·500	
	234	" ...	0·11 1/8	1·0	1·0 1/8	1·0 3/8	1·0 3/8	1·1 3/8	1·1 1/8	1·2 3/8	1·2 7/8	3·250	
	235	" ...	7·4 3/4	7·4 1/8	7·4 1/8	7·4 3/4	7·4 1/8	7·5 3/8	7·4 7/8	7·5 1/8	7·5 1/8	1·375	Ditto.
Total ...			...	...	...	...	...	...	...	...	...	764·225	
Average per tree per annum.			...	...	...	...	...	...	...	...	...	·634	

W. G. ALLAN,
Deputy Conservator of Forests, Kheri Division.

APPENDIX D.

Forest Areas in the Kheri District.

Compartment No.	Sál Forest.	Inferior Forest and Phántas.	Private Land included in Compartment lines.	Total Area.	Remarks.
	Acres.	Acres.	Acres.	Acres.	These areas have been deduced by Planimeter from the Revenue Survey 1-inch map of the Kheri District.
1	1,913·6	19·2	...	1,932·8	
2	985·6	567·2	...	1,561·8	
3	1,811·2	1,935·2	...	3,746·4	
4	1,836·8	364·8	...	2,201·6	
5	2,515·2	310·8	...	2,826·0	
6	473·6	...	...	473·6	
7	1,758·6	662·8	...	2,421·4	
8	1,699·6	42·0	...	1,741·6	
9	985·6	172·8	...	1,158·4	
10	1,068·8	518·4	...	1,587·2	
11	550·4	102·4	...	652·8	
12	659·2	460·8	...	1,120·0	
13	665·6	262·4	...	928·0	
14	2,150·4	633·6	262·4	3,046·4	
15	915·2	89·6	...	1,004·8	
16	832·0	403·2	...	1,235·2	
17	1,158·4	275·2	51·2	1,484·8	
18	1,164·8	947·2	851·2	2,963·2	
19	505·6	...	...	505·6	
20	2,054·4	38·4	...	2,092·8	
21	838·4	587·4	...	1,425·8	
22	1,926·4	332·8	108·8	2,368·0	
23	803·6	57·6	...	861·2	
24	1,088·0	409·6	153·6	1,651·2	
25	1,113·6	...	...	1,113·6	
26	1,164·8	...	...	1,164·8	
27	972·8	185·6	...	1,158·4	
28	320·0	422·4	...	742·4	
29	1,574·4	1,363·2	102·4	3,040·0	
30	268·8	...	...	268·8	
31	236·8	...	...	236·8	
32	364·8	22·2	...	387·0	

Forest Areas in the Kheri District—contd.

Compartment No.	Sál Forest.	Inferior Forest and Phántas.	Private Land included in Compartment lines.	Total Area.	Remarks
	Acres.	Acres.	Acres.	Acres.	
33	1,305·6	1,299·2	1,619·2	4,204·0	
34	1,094·4	1,043·2	1,068·8	3,206·4	
35	601·6	883·2	1,196·8	2,681·6	
36	627·2	1,676·4	889·6	3,193·2	
37	307·2	...	...	307·2	
38	416·0	...	...	416·0	
39	1,816·8	204·8	19·2	2,040·8	
40	832·0	...	...	832·0	
41	684·8	44·8	1·0	730·6	
42	1,190·4	...	...	1,190·4	
43	1,395·2	243·2	...	1,638·4	
44	198·4	627·2	2,112·0	2,937·6	
45	812·8	966·4	473·6	2,252·8	
46	1,689·6	1,127·6	1,440·0	4,257·2	
47	384·0	505·6	70·2	959·8	
48	3,091·2	608·0	...	3,699·2	
49	307·2	51·2	...	358·4	
50	2,195·2	761·6	166·4	3,123·2	
51	563·2	908·8	1,139·2	2,611·2	
52	1,433·6	1,299·2	...	2,732·8	
53	3,075·6	51·2	...	3,126·8	
54	1,875·2	70·4	...	1,945·6	
55	2,080·0	288·0	435·2	2,803·2	
56	1,664·0	601·6	627·2	2,892·8	
57	1,753·6	339·2	...	2,092·8	
58	678·4	160·0	...	838·2	
59	160·0	...	...	160·0	
60	358·4	76·8	102·4	537·6	
61	2,371·6	...	...	2,371·6	
62	3,360·0	44·8	...	3,404·8	
62*a*	211·2	147·2	...	358·4	
63	844·8	83·2	...	928·0	
64	3,718·4	678·4	857·6	5,254·4	

Forest Areas in the Kheri District—concld.

Compartment No.	Sál Forest.	Inferior Forest and Phántas.	Private Land included in Compartment lines.	Total Area.	Remarks.
	Acres.	Acres.	Acres.	Acres.	
65	1,856·0	2,380·8	...	4,236·8	
66	1,395·2	76·8	...	1,472.0	
67	1,107·2	288·0	...	1,395·2	
68	1,422·4	140·8	...	1,563·2	
69	1,593·6	89·6	...	1,683·2	
70	825·6	57·6	...	883·2	
71	76·8	44·8	...	121·6	
72	902·4	1,216·0	...	2,118·4	
73	2,355·2	736·6	...	3,091·8	
74	544·0	192·0	...	736·0	
75	1,638·4	723·0	...	2,361·4	
76	...	15,488·0	...	15,488·0	
77	...	7,635·2	160·0	7,795·2	
78	...	25,817·6	793·6	26,611·2	
79	...	10,764·8	...	10,764·8	
80	...	2,688·0	...	2,688·0	
Total ...	93,191·4	94,326·6	14,701·6	2,02,219·6	

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